

From: [Steve Roy](#)
To: [Fehrs, Jeff](#)
Cc: [Laurie Adams](#)
Subject: RE: Battery Street Sewer rehab with CIPP
Date: Friday, June 19, 2015 3:49:42 PM

Hi Jeff,

Per the OM&R Plan approval letter from Dennis Bryer to Laurie Adams dated 7/6/10, I am confirming that the Battery Street brick sewer is lined from Cherry to College Streets using CIPP (cured-in-place-pipe) technology. The original work was done in November 2010 by Reynolds InLiner and then again in July 2013 by Layne after the original liner had failed.

Feel free to contact me with any questions or comments.

Steve

Steve Roy, PE
Water Resources Engineer
Burlington Public Works
53 Lavalley Lane
Burlington, VT 05401
T: 802.865.7258
F: 802.864.7653

From: Fehrs, Jeff [mailto:Jeff.Fehrs@state.vt.us]
Sent: Friday, June 19, 2015 2:07 PM
To: Steve Roy
Subject: Battery Street Sewer rehab with CIPP

Steve, Hi-

Friendly reminder – during the inspection I conducted on 6/9 we discussed your providing me with confirmation that Battery Street has been rehabilitated with cured in place pipe. If I remember correctly (note: a big “if”), you made a copy of our OM&ER Plan approval letter (dated July 6, 2010) in which Dennis Bryer requested the confirmation. An e-mail confirmation works for me.

Thanks!

Jeff

Jeff Fehrs, P.E.
Wastewater Management Program
Vermont Department of Environmental Conservation
1 National Life Drive, Main 2
Montpelier, VT 05620-3522
802-490-6185 / jeff.fehrs@state.vt.us
www.watershedmanagement.vt.gov



**State of Vermont
Department of Environmental Conservation**

Agency of Natural Resources

Wastewater Management Division
103 South Main Street – The Sewing Building
Waterbury VT 05671-0405
Phone: 802-241-3822
Fax: 802-241-2596
<http://www.anr.state.vt.us/dec/www/wvmd.cfm>

July 6, 2010

Ms. Laurie Adams, Assistant Director
City of Burlington - DPW Water Quality
P.O. Box 878
Burlington, VT 05402

Subject: NPDES #VT0100153, Permit #3-1331, Burlington Main Wastewater Treatment Facility
Approval of Collection System Operation, Management and Emergency Response Plan

Dear Laurie:

I have reviewed the Operation, Management and Emergency Response Plan for the Burlington Main Sewage Collection System that was received by this office on July 1, 2010. The document has been found to be acceptable, fulfilling the requirements of 10 VSA, Chapter 47, Section 1278. This Operation, Management and Emergency Response Plan will by reference become part of the requirements of the Discharge Permit for the facility when it is renewed and becomes effective. The Burlington Main Collection System Operation, Management and Emergency Response Plan shall be incorporated with the Operation, Management and Emergency Response Plan for the three Burlington Wastewater Treatment Facilities, sewage pump stations and stream crossings throughout the city that was previously approved on August 20, 2009.

At this time it is recommended that the City of Burlington implement the approved Burlington Main Sewage Collection System Operation, Management and Emergency Response Plan to prevent sewage overflows. It is recommended that records be kept to document that the inspection schedule is being followed. For the response plan, it is recommended that steps be taken to ensure that the equipment is available on short notice and that responses can be carried out in a timely manner to prevent/mitigate spills. When the renewed Discharge Permit becomes effective, these recommendations will become requirements.

Please provide written confirmation to this office by December 31, 2010 to substantiate that the rehabilitation (Cured-In-Place-Pipe) of the reach of sewerline on Battery Street from Cherry Street to College Street has been completed. The City is commended for taking the initiative to address this 'element of concern'.

A copy of the Operation, Management and Emergency Response Plan needs to be retained at the treatment facility at all times for easy reference by the operators. The operators should review the document periodically so they remain familiar with the response plan.



Ms. Laurie Adams

July 6, 2010

Page 2 of 2

The operators need to periodically review and update the Operation, Management and Emergency Response Plan to account for any improvements and in response to any situations encountered. The Operation, Management and Emergency Response Plan will need to be updated in the future each time the Discharge Permit is renewed, similar to the procedure currently being used for Electric Power Failure Plans. If it is determined following a reassessment of the various components, inspection schedule, and response plan that the document does not need to be revised, then resubmission of the document should not be necessary.

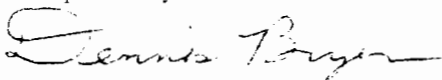
It is anticipated that the next time the permit is renewed language will be included that consolidates the Operation, Management and Emergency Response Plan and Electric Power Failure Plan into a single document. Also, it is envisioned that the new permit language will require that any updates to the plans need to be submitted for review and approval within 30 days following the effective date of the permit.

The review and approval of this Operation, Management and Emergency Response Plan by the Agency of Natural Resources shall not be construed as having relieved, modified, or in any manner affected the permittee's obligation to comply with all other federal, state, or local statutes and permits nor shall it relieve the permittee from civil or criminal penalties for any non-compliance.

It is requested that an electronic copy of the final Operation, Management and Emergency Response Plan and attachments, only if already available in electronic format, be submitted to Ginny Little at ginny.little@state.vt.us. A pdf file is recommended, and we can also accept a document in Microsoft Word. It would be extremely helpful to receive an electronic copy of the large plan sheets as our resources to scan plans are very limited.

Please feel free to contact me if there are any questions or comments regarding this letter.

Respectfully,



Dennis Bryer, P.E.
Environmental Engineer

C: Brian Kooiker, Wastewater Management Division
Tim Grover, Burlington Main/North WWTFs Chief Operator
Burlington Main Wastewater Treatment Facility Compliance File
Burlington Main Wastewater Treatment Facility Permit File

Y:\WW_Discharge\O&M_Inspectors\Burlington Main\3-1331070610.doc

Steve Goodkind, P.E.
Public Works Director

Laurie Adams
Assistant Director



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June 30, 2010

Dennis Bryer, P.E. Environmental Engineer
State of VT ANR
Wastewater Management Division
103 South Main Street – The Sewing Building
Waterbury, VT 05671-0405

Re: Burlington Sewage Spill Prevention Plan (SSPP) for Main Collection System

Dear Mr. Bryer:

The City of Burlington Public Works Wastewater Division is submitting our last SSPP for the Main Treatment Plant Collection system. If you have any questions or comments please let me know.

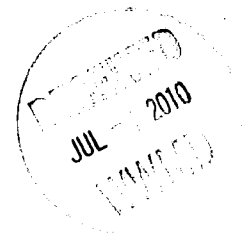
Sincerely,

A handwritten signature in black ink, appearing to read "Laurie Adams", is written over the word "Sincerely,".

Laurie Adams
Assistant Director DPW Water Quality

Cc: Gary Greenwood
Tim Grover
Steve Roy

Main Wastewater Collection System Sewage Spill Prevention Plan



The Main wastewater collection system is comprised of sanitary and combined sewer collection pipes, manholes, wastewater pumping stations and force mains. Main plant's collection system was constructed between 1871 and 2010. The most recent force main replacement was on Flynn Avenue where 1,220 feet of 6 inch fusion welded DR17 HDPE was installed from the Oakledge Beach (Flynn Ave) pump station to the railroad tracks. This collection system includes fourteen (14) pump stations, constructed between 1962 and 1986. Existing GIS data, wastewater maps, manhole and pump station logs were compiled into databases for purposes of this report and for use by Public Works personnel. Table 1 below summarizes the data for this collection system.

TABLE 1 – MAIN COLLECTION SYSTEM

DESCRIPTION	DATA SUMMARY
Service Area	4 square miles
Total Sanitary Sewer	17.7 miles
Total Combined Sewer	26.9 miles
Sewer Size Range	6" to 72"
Total Number of Sanitary/Combined Manholes	1,505
Pipe/Manhole Age (Year Constructed)	1871 through 2010
Number of Pump Stations	14

Burlington as an older city still has a number of brick and stone sewers within the collection system. Last summer we had a partial failure causing a large sinkhole in the sewer line on Battery Street across from the Hilton hotel. The longest length of brick sewer happens to be on Battery Street and it is circa 1888. The brick sewer runs approximately 4,200 feet from the intersection of Front at North Street, south on Battery to just north of the intersection of Battery & Maple Street. As a result of this repair our wastewater crew videotaped the length of the Battery Street brick sewer. We were fortunate with this break that we were able to bypass the flow while the repair took place and that it did not overflow to College Street where there is a storm only pipe leading to the lake.

From the results of the video tape we determined it was prudent to move forward with a Request for Proposals for the most vulnerable section utilizing the Cured-in-Place-Pipe (CIPP) method for a stretch of 800 feet from Cherry to College Streets. We recently received City Council approval to sign a contract for this project.

Our Main collection system map includes the areas that have been filmed (blue) and also highlighted areas that wastewater staff inspected with our EnviroSight/quickview zoom pipeline camera in manholes along vulnerable pipe that had not been recorded as inspected.

Although we do not have the same 20 year evaluation to reflect on as for North and Riverside's Collection system SSPP, we do have a baseline of information to prioritize our attention from the areas filmed and the age of the pipe. With our new CCTV system we will continue to evaluate the Main Plant collection system. The response protocol submitted with the North Collection system plan is the same for the Main system (AP-WW-106).

Steve Goodkind, P.E.
Public Works Director

Laurie Adams
Assistant Director



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May 25, 2010



Dennis Bryer, P.E. Environmental Engineer
State of VT ANR
Wastewater Management Division
103 South Main Street – The Sewing Building
Waterbury, VT 05671-0405

Re: Burlington Sewage Spill Prevention Plan (SSPP) for North Collection System

Dear Mr. Bryer:

The City of Burlington Public Works Wastewater Division is submitting our final SSPP for the North Treatment Plant Collection system. If you have any questions or comments please let me know. We are in the process of developing our last plan for the Main Collection system.

Sincerely,

A handwritten signature in cursive script, appearing to read "Laurie Adams", is written over the typed name.

Laurie Adams
Assistant Director DPW Water Quality

Cc: Gary Greenwood
Tim Grover
Steve Roy

North Wastewater Collection System Sewage Spill Prevention Plan

The North wastewater collection system is comprised of sanitary and combined sewer collection pipes, manholes, wastewater pumping stations and force mains. North plant's collection system was constructed between 1939 and 1991, with an average age of 44 years. This collection system includes seven (7) pump stations, constructed between 1966 and 1990. Existing GIS data, wastewater maps, manhole and pump station logs were compiled into databases for purposes of this report and for use by Public Works personnel. Table 1 below summarizes the data for this collection system.

TABLE 1 - NORTH COLLECTION SYSTEM

DESCRIPTION	DATA SUMMARY
Service Area	3.2 square miles
Total Sanitary Sewer	5.6 miles
Total Combined Sewer	3.5 miles
Sewer Size Range	8" to 24"
Total Number of Sanitary/Combined Manholes	550
Pipe/Manhole Age (Year Constructed)	1939 through 1991
Number of Pump Stations	7

Included with this document are two different maps of the North Collection system.

Inspection of underground piping is impossible to perform without the proper equipment. Since 1986, Burlington Public Works has owned and operated equipment for videotaping underground piping. Recently DPW received approval to replace this 1986 equipment with a complete updated package from Cues including camera, software, trailer set up for viewing videoing in progress. We expect delivery of this new equipment in July 2010.

Our approach with this collection system is similar to the Riverside Collection system SSPP. We began with the information from the 2001, 20-Year Engineering Evaluation as a starting point to prioritize our trouble spots. In the case of the North collection system those five highest scoring areas were re-videoed in anticipation of this evaluation and one section Woodbury Road has since been replaced. The other four areas were all in good condition but for some root intrusion. We will schedule for root removal as part of our preventive maintenance. In addition wastewater staff took all the existing videotape records and plotted this data (blue lines on separate map) on the North Collection map to give us a sense of what areas had not been inspected. Staff used that information to look where the oldest VC pipe was located especially if it is in close vicinity to the lake. Next

Wastewater staff used our Envirosight/quickview zoom pipeline camera in manholes along the pipe that had not been recorded as inspected. This data is also hand marked (orange highlight) on the map of the North collection system with this report.

With 38% of the North collection system combined, there is a chance of a sewer line break making it to waters of the state. A response protocol was written specifically for the Street Division crew and our Wastewater personnel to try and prevent untreated wastewater from reaching waters of the State. This Action Plan, AP-WW-106 is an updated version of our original SSPP from 2008.

AP-WW-106

AP Summary:	This Action Plan applies to... a Broken Pipe in the Collection System						
Initiation and Notification:	Public Works discovers a problem due to a customer complaint or other reason such as a sink hole, reduced flow at WWTP, water surfacing that does not appear as potable water, etc.		Dispatcher should notify DPW Right of Way Foreman, Assistant Director Water Quality, City Engineer or Chief Operator of affected area.				
Equipment Identified:	<table><tr><th>Equipment</th><th>Location</th></tr><tr><td>Equipment that could be used for a repair includes mud suckers at Streets; a 4" portable pump at East & North Plant. Hertz First Choice rental for other equipment @872-5300</td><td>Entire wastewater collection system including river crossings.</td></tr></table>	Equipment	Location	Equipment that could be used for a repair includes mud suckers at Streets; a 4" portable pump at East & North Plant. Hertz First Choice rental for other equipment @872-5300	Entire wastewater collection system including river crossings.		
Equipment	Location						
Equipment that could be used for a repair includes mud suckers at Streets; a 4" portable pump at East & North Plant. Hertz First Choice rental for other equipment @872-5300	Entire wastewater collection system including river crossings.						
Specific Activities:	If water is surfacing and leading toward a ditch, storm drain or water body such as the Winooski river, Lake Champlain, or other tributaries, immediately try to dam, divert to prevent overflow from reaching waters of the State. Area should be secured with appropriate Traffic Control measures such as cones, barricades.		Remember the broken pipe could be a gravity line or force main. If uncertain about where the overflow is leading to, proceed as if it is heading to a waterway and Dam, Divert as quickly as possible.				
I. Assess the Problem	Check upstream and down stream manholes, use the camera truck and film the pipe to get a more accurate assessment to determine a repair strategy and the equipment and staff needed.		If the pipe that is broken is in a river crossing a different Action Plan applies. See AP-WW-Collection System River Crossing				
II. Isolate and Fix the Problem	If the depth of the repair is something Streets can excavate line up crew and equipment. Call in Dig Safe @ 1-888-344-7233.		If the excavation required is too deep or beyond DPW capacity, contact previously utilized contractors such as Engineers Construction at 863-6389. If bypass is needed set up for this diversion prior to the start of work.				
III. Monitoring	Ensure that while repair is undertaken, wastewater continues to flow to intended pipe.		In the case of overflows or discharges to natural waterways notify DEC, 802-241-3822. This notice should come from either the Assistant Director Water Quality or the CPO of Main WW Plant or East Plant CPO.				
IV. Recovery and Return to Safety	After repair work is completed, review the pipeline by videotaping and cleaning loose gravel, etc., out of the pipeline.						
V. Report of Findings	Has the pipe been adequately repaired or is further replacement of a larger section of pipe recommended.		Streets should communicate with Engineering group and then Assistant Director Water Quality with long-term recommendations is necessary.				
VI. [AP ID] - Revision Dates	4-2-07, 5-12-10						

North Collection System Pipe Evaluation Starr Farm N121.03 to 02

8" VCT

Footage	Pipe code	Comments
0-70ft	Pipe Sags	
111ft	Inflow and Infiltration at Joint	
111ft	Cracked at Joint	
111ft	Minor roots in joint	
139-145ft	Pipe sags	
212-255ft	Pipe Sags	
255ft	Manhole	End of Inspection

North Collection System Pipe Evaluation Village Green NY345.01 to NY3.45

10"VCT

13ft	Roots in Joint Medium	
27ft	Roots in Joint Heavy	
87ft	Roots in Service	12 O'Clock
108ft	Longitudal Crack Minor	9 O'Clock
119ft	Service Connection Right light roots	2 O'Clock
125ft	Service Connection Top	
127ft	Roots in Joint Medium	
155ft	Service Connection Left	11 O'Clock
168-178ft	Roots in section Medium	
182ft	Service Connection Left	11 O'Clock
186ft	Roots in Joint Heavy	
189-195ft	Roots in section Heavy	
267ft	Service connection Right	3 o'clock
345ft	End of Inspection	

North Collection System Pipe Evaluation Village Green NY345.04 to NY345.03

10" VCT

16ft	Service Connection Left	9 O'Clock
55ft	Service Connection Left	9 O'Clock
58ft	Service connection Right	3 o'clock
77-81ft	Longitudal Cracks Minor	
117ft	Service Connection Left	9 O'Clock
125ft	Service connection Right	2 O'Clock
139-146ft	Longitudal Cracks Minor	
190ft	Service connection Right	2 O'Clock
228ft	Service Connection Left	9 O'Clock
225-236ft	Pipe Sags	
236ft	End of Inspection	

North Collection System Pipe Evaluation Van Patten NP5.09 to 08

135ft	Service Connection Right	3 o'clock
156ft	Service Connection Left	9 O'Clock
190ft	Inflow and Infiltration at Joint	
209-220ft	Grease on sides of pipe	
220ft	Manhole	End of Inspection

Steve Goodkind, P.E.
Public Works Director

Laurie Adams
Assistant Director



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April 16, 2010

Dennis Bryer, P.E. Environmental Engineer
State of VT ANR
Wastewater Management Division
103 South Main Street – The Sewing Building
Waterbury, VT 05671-0405

Re: Burlington Sewage Spill Prevention Plan (SSPP) for Riverside Collection System

Dear Mr. Bryer:

The City of Burlington Public Works Wastewater Division is submitting our final SSPP for the Riverside Avenue Treatment Plant Collection system. We thank you for your comments on our draft we submitted previously. We are in hopes that our modifications meet your approval. If you have any further questions or comments please let me know. We are already in the process of developing our remaining two plans for the North and Main Collection systems.

Sincerely,

A handwritten signature in black ink, appearing to read "Laurie Adams".

Laurie Adams
Assistant Director DPW Water Quality

Cc: Gary Greenwood
Tim Grover
Steve Roy

Riverside Wastewater Collection System Sewage Spill Prevention Plan

The Riverside wastewater collection system is comprised of sanitary and combined sewer collection pipes, manholes, wastewater pumping stations and force mains. The Table 1 below summarizes the data for this collection system.

Table 1

DESCRIPTION	DATA SUMMARY
Service Area	0.5 square miles
Total Sanitary Sewer	1.8 miles
Total Combined Sewer	0.5 miles
Sewer Size Range	6" to 24"
Total Number of Sanitary/Combined Manholes	185
Pipe/Manhole Age (Year Constructed)	1903 Through 1975
Number of Pump Stations	4

For the entire collection system the Wastewater Division relies on the staff of our Right of Way group for sewer line maintenance.

For determining the condition of the collection system the city has both a robotic camera and a quick view zoom camera for spot checks. We recently received bids to replace our 1986 robotic camera and Van with new equipment that would be housed in a trailer that would be utilized by Wastewater staff. This purchase was approved by the DPW Commission April 14, 2010 and we are seeking approval from the Burlington Board of Finance on April 19, 2010. All sewer line blockages can be handled with our 2008 Tenco Vactor. In the event of a blockage staff from Streets is on call 24-7. The call would typically initiate from a homeowner complaint received either by customer service staff during regular business hours or the answering service on off hours. The Tenco Vactor has the capability to cut tree roots. In the event that additional equipment is needed DPW has both the rodder that can be used to remove blockages and reciprocal understandings with other nearby Wastewater Departments. Equipment that can be used in the event of a spill includes two 3,700 gallon tankers, a vactor truck, and 4 inch trash pumps located at each wastewater plant (Page 23 of our ERP lists all emergency equipment). All this equipment is either on-site at one of the three wastewater plants or at the DPW shop at 656 Pine Street. We believe it is important to note that in the collection system that is part of the streets network we have never had a sewer break in the street that has resulted in a release of sewage to waters of the state.

Attached at the end of this document is a map of the Riverside collection system. The sewer line nomenclature is as follows: If the pipe is noted 12VC1910 that means the pipe is 12 inch vitrified clay from 1910. An enlargement of the Colchester Ave/Barrett Street area is discussed in further detail below.

For this plan we utilized the information from the 2001, 20-Year Engineering Evaluation as a starting point to prioritize our trouble spots. Excerpts from this plan are included as

an appendix related to the Riverside system. Essentially the areas that were given the highest scoring for concern in 2001 were re-videoed to assess current condition. This is included in the attached Tables 2 and 3.

The first section reviewed is on Colchester Avenue from MH R1.16 to R1.15. This is 20 inch vitrified clay pipe from the early 1900's. This was video taped in late 2009 for this analysis. Based on the previously utilized risk and probability rating scale we assigned this area a risk of 4 and probability of 2. Given the high R-P value of 8, we will inspect this section twice per year until we are able to make a repair or replacement. For our fiscal year 2011 budget (begins July 1, 2010) we have included a placeholder for completing this repair.

The next area was on East Avenue from MH R1.28 to R1.26. This is 12 inch vitrified clay pipe from the 1950's. Based on new video in 2009 we rated this pipe with a Risk of 1 and Probability of 1. Given the low R-P value there is no need for accelerated inspection.

On Grove Street from MH R1.12 to R1.11 the condition was rated as a Risk of 1 and Probability of 1 from the video in 2009. Although this pipe is from 1910 the condition is still good. Given the low R-P value there is no need for accelerated inspection.

The last section reviewed for this report in 2010 is another section on Colchester Avenue from MH R1.18 to R1.16 and R1.15 to R1.13. There is a 10 foot section that needs replacement. We rated this with a risk of 4 and a probability of 2, with an R-P of 8. As with the other section on Colchester Avenue we will inspect this section twice per year until we are able to make a repair.

In the Riverside collection system we identified a combined sewer overflow (CSO) point located in manhole R1.12 resulting from our camera work and subsequent analysis while doing this evaluation. This can be seen on the system map at the enlarged Colchester Avenue area. Plan and profile drawings of this structure are attached as part of this report. The point of the design is to dissipate the energy from the force of the flow coming down the hill. In the event of a blockage the overflow would empty to the Winooski River. This overflow was actually the original point of discharge into the Winooski River before the Riverside Wastewater Treatment Plant was constructed. We have rated this overflow point with a probability of 1 and a Risk of 5. To gather information about whether this may overflow, we are installing a data logger similar to that which we have at the three CSO overflow points we are currently monitoring in order to determine compliance with the State's 1990 CSO policy.

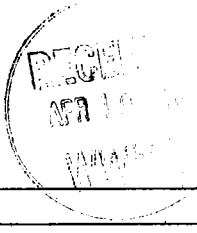
Reports of possible collection system problems are logged into a service request system for tracking and follow up purposes. The Riverside collection system has not been known to have problem areas with grease. Root intrusion has been known to occur at Fletcher Place but this is routinely attended to. The service request report summary for the entire collection system is included in Appendix B.

Table**2****Riverside Collection System Pipe Evaluation Colchester Ave MH R1.16 to R1.15****20" VCT**

Footage	Pipe code	Comments
0-15ft	Pipe Longitudal Crack Crown	roughly first 3 pipe sections from Manhole R16
19.4ft	Service connection Right	3 o'clock
104ft	Service connection Right	3 o'clock
125ft	Service connection Right	3 o'clock
168-190ft	Pipe flattened	egg shaped with multiple cracks
176ft	Service connection Right	3 o'clock
187.2ft	Service connection Left	9 o'clock
191ft	Service connection Right	3 o'clock
197-208ft	longitudal Cracks	On crown and some on sides
208-214ft	multiple cracks & some deflection	
231-236ft	multiple longitudinal cracks	On crown and right side
257-287ft	Pipe flattened	egg shaped with multiple cracks
284ft	Service connection Right	2 o'clock
300-306ft	minor longitudinal cracks	
304.5ft	Service connection Left	9 o'clock
340ft	Service connection Right	protruding >1"
345-360ft	longitudal Cracks & some deflection	On crown and some on sides
400.4ft	Service connection Left	9 o'clock
433ft	Brick Manhole R15	
434.5ft	Service connection Right	4o'clock
434.7ft	Service connection Left	
	End Of Inspection	

Riverside Collection System Pipe Evaluation East Ave MH R1.28 to R1.26**12" VCT**

53ft	Manhole R27	
53.4ft	Connection left side	
82-87ft	Pipe sag or obstruction	
110.5ft	Service connection Right	3 o'clock
113ft	Service connection Right	3 o'clock
120ft	Open Pipe Cracks	
164ft	Service connection Right	3 o'clock
177ft	longitudal crack at crown near joint	
213ft	Service connection Right	3 o'clock
264ft	Service connection Right	3 o'clock
276.5ft	Lamp hole?	
297ft	Lamp hole?	
310.7ft	Service connection Right	3 o'clock



345.3ft	Service connection Right	1 o'clock
348.1ft	Service connection Crown	
376ft	Service connection Right	3 o'clock
381.8ft	longitudal crack at crown near joint	
430.3ft	Service connection Right	3 o'clock
440ft	Roots in joints (minor)	
458ft	Brick Manhole R26	
	End Of Inspection	

Table 3

Riverside Collection System Pipe Evaluation Grove Street MH R1.12 to R1.11

10"VCT

Footage	Pipe code	Comments
70ft	minor longitudinal cracks	also minor joint offsets in 0-70ft
129-135ft	Speculate previous pipe repair	pipe looks different from VCT
139ft	Service connection Right	3 o'clock
199ft	Camera stuck in grit	
	End of inspection	

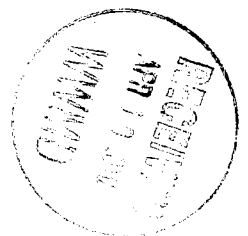
Riverside Collection System Pipe Evaluation Colchester Ave MH R1.18 to R1.16

20" VCT

& R1.15 to R1.13

Footage	Pipe code	Comments
64	Service connection Left	9 o'clock
134	Manhole R. 17	
223	Service connection Left	10 o'clock
250-260	longitudal Cracks	egg shaped with multiple cracks
290	Manhole R.16	
	MH R1.15 to R.1.13	
17	Service connection Left	9 o'clock
98	Service connection Left	protruding >1"
126	Service connection Left	10 o'clock
184	Service connection Left	9 o'clock
197	Manhole R1.14	
31	Service connection Left	9 o'clock
78	Service connection Left	9 o'clock
139	minor longitudinal cracks	
146	Service connection Left	9 o'clock
202	minor longitudinal cracks	
208	Service connection Left	9 o'clock
255	Joint Crack	
276	Manhole R1.13 End of inspection	

Riverside Collection System	Risk	Probability	R-P Value	Controls in Place	Comments
Colchester Ave. MHR1.16 to R1.15	4	2	8	Inspect twice per year	In FY2011 plan to try and finance for in line repair.
East Ave. MHR1.28 to R1.26	1	1	1	Continue periodic review	Historical tracking has not shown much change
Grove St. MH R1.12 to R1.11	1	1	1	Continue periodic review	Historical tracking has not shown much change
Colchester Ave. MHR1.18 to R1.16 & R1.15 to R1.13	4	2	8	Inspect twice per year	In FY2011 will replace 10 ft. section.
Sanitary Sewer Overflow intersection Colchester Ave. & Riverside Ave. MHR1.12	1	5	5	Data logger	Review after some history is collected



RECEIVED
APR 11 1966
WV

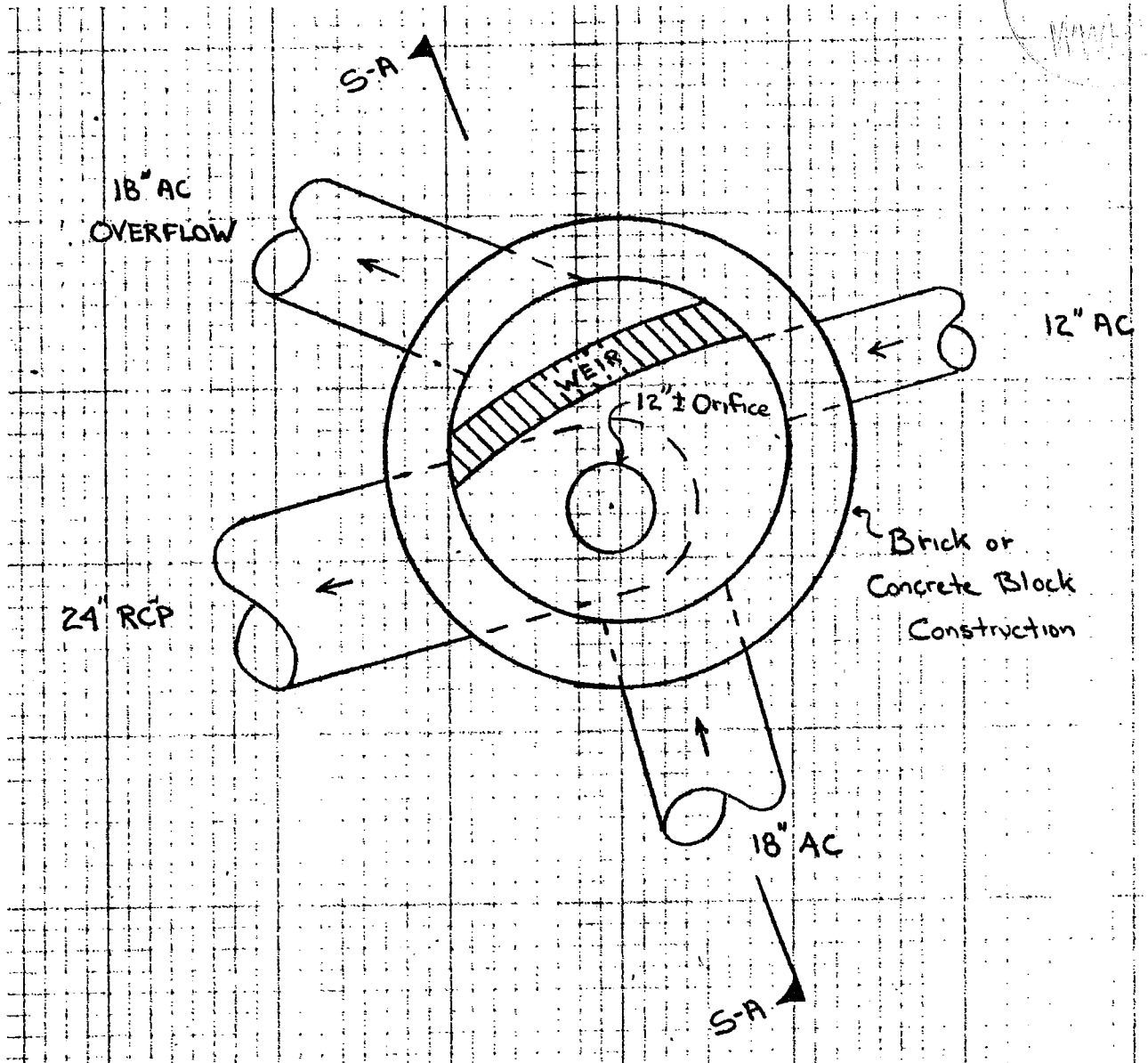


Figure 1 CSO MH R1.12

PROJECT
APR 18 2010
VIA 115

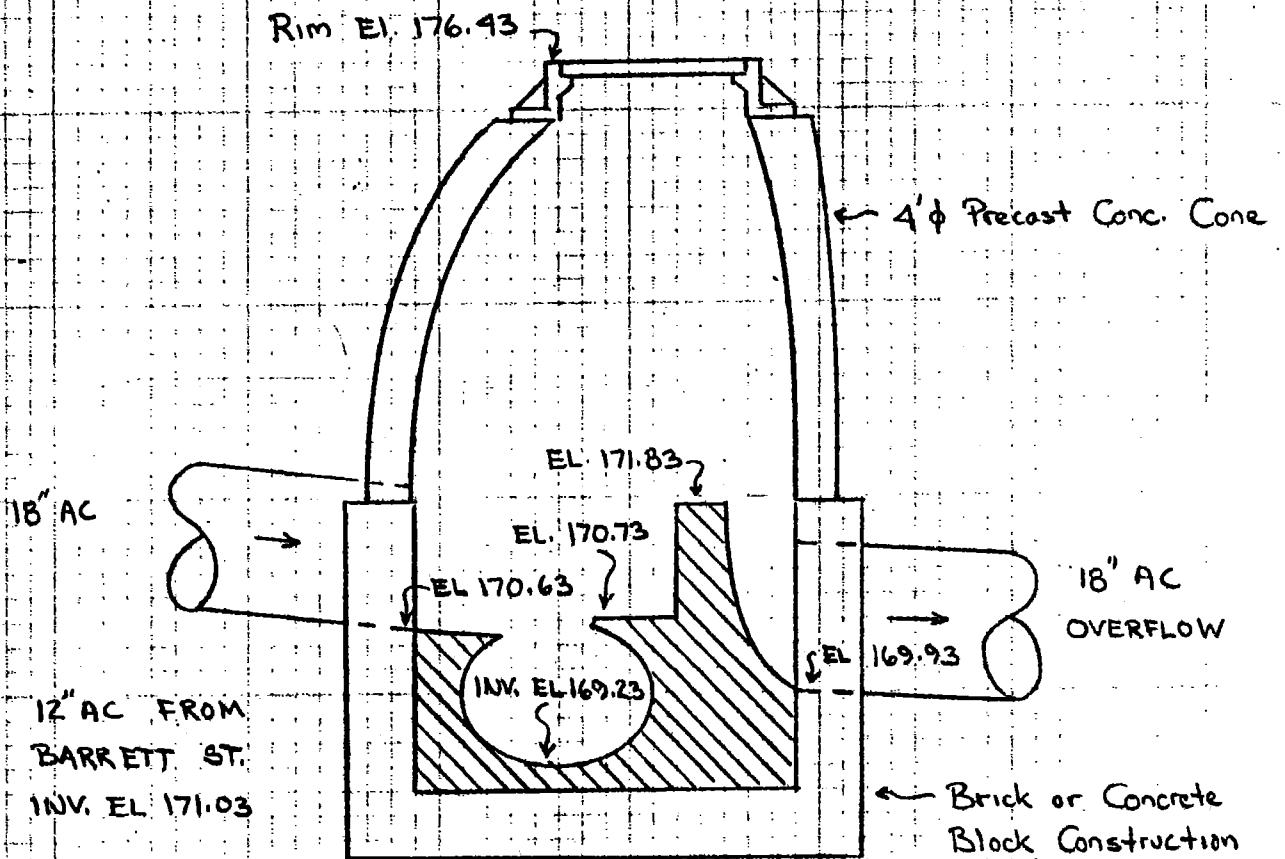
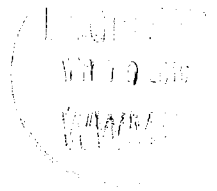
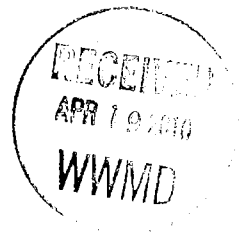


Figure 2 CSO MH R1.12 section view

Appendix A



-----Excerpts from 2001, 20-Year Engineering Evaluation



FINAL REPORT

ENGINEERING EVALUATION OF
NORTH AND RIVERSIDE WASTEWATER
TREATMENT SYSTEMS

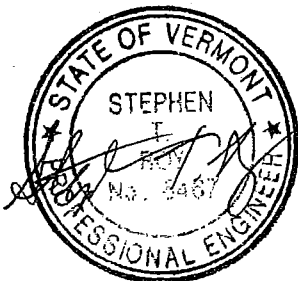
BURLINGTON, VERMONT

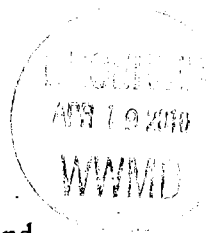
January 2001

Final revision: November 2001

Submitted by:

BURLINGTON PUBLIC WORKS





Introduction and Background

The City of Burlington, Vermont owns and operates three (3) separate wastewater collection and treatment systems. The overall system consists of approximately 35 miles of sanitary and combined sewers, 23 wastewater pumping stations and three advanced secondary wastewater treatment plants with a combined average daily capacity of 8.5 MGD (Million Gallons per Day). Treated flows are either discharged to the Winooski River (North and Riverside Plants) or to Lake Champlain (Main Plant). These discharges are authorized by the National Pollutant Discharge Elimination System (NPDES) and are administered by the Agency of Natural Resources under Permits #3-1331, #3-1245 and #3-1247 for Main, North and Riverside systems, respectively.

Discharge permits for the North and Riverside Facilities were renewed on October 12, 1999 with an expiration date of September 13, 2004. Section B of both permits has a provision for the permittee to conduct or hire a professional engineer to perform an engineering evaluation of the entire wastewater facilities, including collection pipe, pump stations, manholes and the treatment plant. After approval from the Agency of Natural Resources, the City decided to conduct this study in-house by utilizing the knowledge and talents of engineering, wastewater and the right-of-way (R.O.W.) staff who are responsible for maintenance of the gravity sewer system. This report summarizes work performed in evaluating useful life of systems, addressing problems mentioned during Agency inspections, and providing a timeline for recommended capital improvements.

The scope of services performed by staff include:

- Review of existing infrastructure mapping in the City in terms of sewer type, material, size and age.
- Review of data collected by the R.O.W. group showing which pipes have been videoed to date.
- Review of existing manhole log books for pipe data, material(s) of construction, size and age.
- Perform new inspections of a select number of manholes, based upon a selected methodology.
- Development of the above data into a computer database for immediate use by City personnel and eventual use in a Graphical Information System (GIS) database.
- Review historical flow data on wastewater pump stations for available capacity and growth trends.
- Inspection of each station for useful life in terms of structural integrity, mechanical condition, electrical condition, operational problems, and conformance with the latest State and regional requirements.
- Inspection of each treatment facility for useful life in terms of structural integrity, mechanical condition, electrical condition and operational issues.

Riverside Wastewater Collection System Inspection



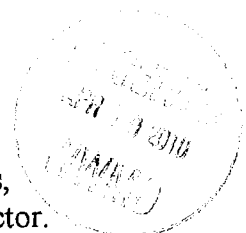
The Riverside wastewater collection system is comprised of sanitary and combined sewer collection pipes, manholes, wastewater pumping stations and force mains. Existing GIS data, wastewater maps, manhole and pump station logs were compiled into databases for purposes of this report and for use by Public Works personnel. Figure 2 in Appendix A shows the extent of the Riverside collection system in Burlington as well as all pipes and manholes. Note that this figure includes stormwater pipes and manholes which are not included in the scope of this report. Table 2 below summarizes the data for this collection system.

TABLE 2 - RIVERSIDE COLLECTION SYSTEM

DESCRIPTION	DATA SUMMARY
Service Area	0.5 square miles
Total Sanitary Sewer	1.8 miles
Total Combined Sewer	0.5 miles
Sewer Size Range	6" to 24"
Total Number of Sanitary/Combined Manholes	185
Pipe/Manhole Age (Year Constructed)	1903 through 1975
Number of Pump Stations	4

Pipe Inspections

Inspection of underground piping is impossible to perform without the proper equipment. Since 1986, Burlington Public Works has owned and operated equipment for videotaping underground piping. As resources permit, they have been working on taping sewer lines with the ultimate goal of having every pipe on record. Each pipe segment (manhole to manhole) includes the video of the pipe interior with a readout of length from the starting point and a paper printout of that segment documenting services plus identified problems such as breaks, cracks, bad joints, root penetrations and infiltration points. These videotapes are numbered and stored in a map room at the new Central Maintenance Facility on Pine Street. To date, there are roughly 140 tapes each containing 2 hours worth of information. Review of every tape in the Riverside system would have been extremely time consuming and tedious, so an inspection methodology was devised.



For this project, staff compiled the video printouts into a database which includes pipe information, video information and pipe condition such as number of breaks, cracks, bad joints, root penetrations, etc. These inspection results were then totaled using a weighted ranking factor. Since pipe breaks and cracks are more critical than root penetrations they were obviously given a higher weight. These scores were then sorted and the videotapes for high scoring (worse condition) pipes were reviewed for determination of the severity of damage and estimated pipe lifespan. A printout of some of the worse pipes in the North system are provided in Appendix D.

Comments on the top five (5) highest scoring pipe segments are summarized below:

1. Colchester Avenue, a 430 foot length of 20" vitrified clay pipe between manholes R1.16 and R1.15. This pipe is in poor shape with breaks at the crown of the pipe and longitudinal stress cracks along the sides. The pipe has begun to deflect into an egg shape in areas of the break where the hoop strength of a circular pipe has been compromised. Public Works personnel are aware of this problem and aren't sure how to proceed given the high traffic and high wastewater flows in this pipe which services the hospital (FAHC), university (UVM), East Avenue and numerous homes. This problem is exacerbated by the fact that the roadway has 6" - 8" of concrete under the asphalt. Vermont Pipeline Services is looking at video of this pipe to determine if any in-situ repairs are possible.
2. Barrett Street, a 140 foot length of 12" vitrified clay pipe between manholes R112.04 and R112.03. The crown of this pipe has multiple longitudinal cracks, some of which run the entire length of the pipe's 2 foot sections. No infiltration or exfiltration is visible from these cracks. Since this videotape is now 12 years old, recommendations are to revideo this pipe to monitor cracks and repair if necessary. This pipe is a candidate for in-situ repair using methods performed by Vermont Pipeline Services.
3. Grove Street, a 250 foot length of 10" vitrified clay pipe between manholes R112.12 and R112.11. Two cracks and three bad joints were reported in 1988. Review of the video reveals semi-circular cracks along the crown of the pipe and offset joints. No infiltration or exfiltration is visible from these cracks or joints. However, there was a pile of inorganic debris (e.g. silt, sand) that filled the lower third of this pipe. Once again, since this videotape is now dated, recommendations are to clean the pipe, revideo this section to monitor cracks and repair if necessary. This pipe is also a candidate for in-situ repair using methods performed by Vermont Pipeline Services.
4. Barrett Street, a 130 foot length of 12" vitrified clay pipe between manholes R112.02 and R112.03. Both cracks and breaks are semi-circular along the crown of the pipe, with breaks being reported when gaps in the clay are visible. No infiltration or exfiltration are visible from these breaks or cracks. Since this videotape is now 12 years old, recommendations are to revideo this pipe to monitor cracks and repair if necessary.
5. East Avenue, a 400 foot length of 12" vitrified clay pipe between manholes R1.28 and R1.27. One break and three bad joints were reported in 1991. Review of this video reveals the break as a piece of clay from 3 o'clock to 9 o'clock that has separated from the pipe at one of the joints. No infiltration or exfiltration is visible from this break. The reported bad joints are two with moderate offsets and one with a crack. Once again, these problems would give the pipe an overall fair rating. Since this videotape is also dated,

recommendations are to revideo this section to monitor cracks and repair if necessary.

Vermont Pipeline Services (VPS) offers in-situ repairs of cracked pipes or broken joints that still have structural integrity. They use a machine that includes a video camera, expandable pipe plugs and epoxy gel injection hose to locate cracks/breaks, inject epoxy gel plus pressure test the work to confirm a good seal. A preliminary opinion of cost spreadsheet at the end of this document includes an allowance for in-situ pipe work.

Manhole Inspections

The Riverside collection system alone has a recorded total of 308 manholes with approximately 210 of them dedicated to sanitary and combined lines. In 1980, Burlington had contracted with the firm of Farnsworth & Associates to inspect each manhole and record its condition as well as other pertinent information such as number of inlet/outlet pipes, evidence of infiltration or surcharging, etc. This information was kept in numerous binders at Public Works and has been valuable over the years.

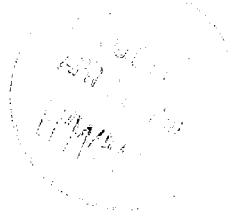
There was not enough time and resources available to reinspect each and every manhole, so once again a methodology was devised. Since the manholes on most streets were constructed at the same time and of the same materials, it was assumed that the condition of manholes were similar for a particular street. The method selected was to inspect one manhole from each street for its current condition. This information was entered into a manhole database along with earlier data for initial use by this project and for the GIS system database. A manhole inspection form was devised, along with a tip sheet on inspecting manholes. These documents are included in Appendix D.

A total of 14 manholes were inspected on the Riverside system and the data was sorted based upon the condition of walls, inverts and benches in that order of priority. As expected, the newer precast structures were in the best shape, followed by brick manholes which in fact were generally in good shape given their age.

The worse manhole inspected in the Riverside system was RP3.02 located on Fletcher Place. Constructed around 1927, the 4' brick manhole has mortar missing between bricks in the walls, does not appear to have a bench to contain flow from inlet to outlet and therefore is full of debris. Since the bricks themselves are in good condition, this manhole should be parged within a 10 year period. Other manholes that had walls in good condition but benches or inverts rated as fair were on Barrett Street, Bilodeau Court, Chase Street and Grove Street. These structures will need attention within 20 years.

Appendix B

City of Burlington Service Request History for Wastewater Collection System



CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#7399 Possible sewer plug 1:13pm (heavy rains)	52 Alder lane	7/13/2007	ROW - Streets	Complete	N/A
Possible sewer plug. Called out Dan Hill and Gary from East Plant.	105 Appletree Point Rd.	1/8/2002	Water/Waste	Complete	
possible sewer plug. entrance to Colonial Sq., in the middle of cemetery - Lorand has worked on this one before.	253 Archibald	8/22/2007	ROW - Streets	Complete	Customer
Possible sewer plug.	253 Archibald St	8/8/2001	ROW - Streets	Complete	Customer
building especially 8 Arthur Ct has been having sewer problems, called plumber , he found nothing. Sent Mark out at 1:40pm, not ours 2:15. and I called Peggy back.	8 Arthur Court	11/4/2003	ROW - Streets	Complete	Customer
SR#8618 (7:40am) Steve 201-835-5569 2nd call - #84 11:57 possible sewer plug Called night before and Erine delt with it but its still plugged.	161 Austin Dr	7/18/2008	ROW - Streets	Complete	N/A
SR#9732 Possible sewer plug 11:56 am	33 Balsam St	6/26/2009	ROW - Streets	Complete	N/A
" A Single Pebble" - sewer backed up this weekend. Wants us to check our line and to let him know if he has a sewer trap to stop this from happening.	133-135 Bank St	10/28/2002	ROW - Streets	Complete	N/A

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#6558 Possible sewer plug 2:29pm "Oasis Diner"	189 Bank St	9/25/2006	ROW - Streets	Complete	N/A
Potential sewer plug.	51 Barrett St.	3/11/2004	ROW - Streets	Complete	Customer
SR#9100 Possible sewer plug (2:00)	52 Barrett St	12/10/2008	ROW - Streets	Investigatio	Pending
Possible sewer plug (10:30 a.m.)	38 Batchelder St	10/29/2003	ROW - Streets	Complete	N/A
SR#: 8903 possible sewer plug 3:45	Battery & Pearl	9/30/2008	ROW - Streets	Complete	
Possible sewer plug. 12:35 p.m.	196 Battery St	3/9/2004	ROW - Streets	Complete	N/A
SR#9469 Possible sewer plug 2:04pm Old massa glass building 1st floor	131 Battery St	4/21/2009	ROW - Streets	Complete	N/A
SR#6392 Customer left a voice message on 4-7428 about previous sewer back ups in her basement this year and still was experiencing problems. Called into dan at 8:15am-vb	Bennington Ct	8/2/2006	ROW - Streets	Complete	Customer

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 8517 possible sewer plug - called into Dicky 1:40 Note: rained very hard yesterday, alot of rain in a short amount of time.	29 Bennington Ct	6/23/2008	ROW - Streets	Complete	
I would like to once again express my frustration that sewage is continuing to enter my basement with heavy rains despite the work that has been done on the storm drains in Bennington Ct. and Saratoga Ave. Even after bleaching, I have flies after these last two rounds. As I have said previously, I realize that our street is a small one, but being at the bottom of the development. we get much of the water from higher up on Saratoga ave.	Bennington Ct	8/6/2009	ROW - Streets	Investigatio	Pending
SR#5895 Possible sewer plug - 8:55 am Called into Bernie 9:10am	47 Bilodeau Ct	4/11/2006	ROW - Streets	Complete	N/A
SR#8232 Possible sewer plug - P & P Septic - at the above location called and wanted someone to go there as they feel it was the City Main	74 Bilodeau Ct	4/15/2008	ROW - Streets	Complete	N/A
Possible sewer plug. Problem has been checked twice by her plumber. Grade not steep enough (drain).	41 Bilodeau Parkway	1/8/2001	ROW - Streets	Complete	
Possible sewer Plug - 1:00	41 Bilodeau Pkwy	12/1/2003	ROW - Streets	Complete	N/A
Possible sewer Plug - 10:50 am	41 Bilodeau Pkwy	8/10/2004	ROW - Streets	Complete	N/A
Possible broken sewer line at our connection.	81 Birch Ct	2/3/2003	ROW - Streets	Complete	N/A

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Sewer plug.	96 birch ct.	2/28/2005	ROW - Streets	Complete	Customer
Sewer plugs.	64 Birch Ct. and 69 Birch Ct.	3/30/2005	ROW - Streets	Complete	Customer
Possible sewer plug. Customer left message on phone and called in again at 8:05 am. Customer called back 10:00 am -told customer to call Roto Roter per Dicky P&P called back at 1:00 to say that they had popped the manhole and it was full.	64 Birch Ct.	4/6/2005	ROW - Streets	Complete	N/A
SR # 5715 Possible sewer plug - 9:40 am	106 Birch Ct	1/20/2006	ROW - Streets	Complete	N/A
SR#10048 Possible sewer plug 9:08 am	37 Bittersweet Lane	9/28/2009	ROW - Streets	Complete	Customer
Possible sewer plug - started after street flooded last night from storm. 9:20	40 Booth St	7/6/2005	ROW - Streets	Complete	N/A
Slow sewer lines..... Possible plug. 12:31pm	38 Brierwood Lane	11/12/2003	ROW - Streets	Complete	Customer
possible sewer plug	27 Bright St	6/13/2007	ROW - Streets	Complete	Customer

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR# Possible sewer plug called in at 9:47am	25 Brookes Ave	6/13/2006	ROW - Streets	Complete	N/A
SR#7972 Possible sewer plug 8:10am	86 Brookes Ave	2/5/2008	ROW - Streets	Complete	N/A
SR # 9701 Possible sewer plug. 88 is about midway down the street	88 Buell St	6/17/2009	ROW - Streets	Complete	Customer
Possible sewer plug 2:40 a.m. 4/29/04	7 Canfield	4/30/2004	ROW - Streets	Complete	N/A
customer left message on 4-7428 on 6/18/05 at 9:30 am - Sewer sluggish - answering service didn't page out because customer didn't feel it was a threatening problem. gave to Dan at 9:30 am 6/20/05 -	27 Caroline St	6/20/2005	ROW - Streets	Complete	N/A
Possible sewer plug	Case Parkway	6/17/2005	ROW - Streets	Complete	N/A
Possible sewer plug. Customer informed us that the line connecting to Latham Ct is usually the problem. 2:45 p.m.-vb	67 Case Pkwy	8/26/2003	ROW - Streets	Complete	N/A
possible sewer plug. 2:10	12 Catherine St	1/26/2005	ROW - Streets	Complete	

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Possible sewer plug 11:27 a.m. on 11/27/03	101 Cayuga Ct	11/28/2003	ROW - Streets	Complete	N/A
Possible sewer plug	106 Cayuga Ct	9/27/2007	ROW - Streets	Complete	Customer
SR # 8099 possible sewer plug	56 Cedar St	3/17/2008	ROW - Streets	Complete	Customer
RSN 9494 on 4/27/09 @ 11:48 Sewer back up Called again on 4/28/09 @ 10:33 and asked to send someone again as the plumber said there was a partial block 50 feet out from house. Asked to have the line checked on Lafountain Street also.	56 Cedar Street	4/27/2009	ROW - Streets	Complete	Customer
Possible sewer plug	9 Central Ave	3/17/2003	ROW - Streets	Complete	
Possible sewer plug 8:10	82 Central Ave	11/8/2004	ROW - Streets	Complete	
SR#7919 Possible sewer plug 11:30 am	40 Central Ave	1/10/2008	ROW - Streets	Complete	N/A
SR # 7970 Possible sewer plug 3:50 pm called into Brian Bessette.	40 Central Ave	2/4/2008	ROW - Streets	Complete	

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 7999 Possible sewer plug 10:45 am to Dick	40 Central Ave	2/13/2008	ROW - Streets	Complete	N/A
SR # 8109 Possible sewer plug 3:30 pm, called Ernie he was on call.	40 Central Ave	3/19/2008	ROW - Streets	Complete	
SR # 5758 possible sewer plug 11:00	49-55 Chase St	2/7/2006	ROW - Streets	Complete	Customer
Sewer plug.	136 Cherry Ln.	3/7/2005	ROW - Streets	Complete	Customer
SR#6547 Possible sewer plug - 3:00	159 Cherry St	9/19/2006	ROW - Streets	Complete	N/A
Possible sewer plug.	169 Church St	2/14/2003	ROW - Streets	Complete	
when it rains hard the drains back up into their basement and floods with sewer and water. Dicky, please go up and check this out.	123 Church St-Ri Ra	6/14/2007	ROW - Streets	Complete	
SR#9268 Possible sewer plug.....	136 1/2 Church St	2/17/2009	ROW - Streets	Investigatio	Pending

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 9763 Possible sewer plug	131 Church St	7/8/2009	ROW - Streets	Complete	
SR # 6671 Kiss the Cook, across possible sewer plug, please check our drains.	Church St & Bank St	11/6/2006	ROW - Streets	Complete	Customer
SR#6088 Possible sewer plug called in 3:34pm (Michael Kehoes)	Church St & College St (Corner)	5/26/2006	ROW - Streets	Complete	N/A
Possible sewer plug.	265 Colchester Ave	3/14/2003	ROW - Streets	Complete	
Sewer Back up 1:00 p.m.	52 Colchester Ave	8/30/2004	ROW - Streets	Complete	N/A
SR#9457 Just received a call from a concerned citizen at 339 Colchester Ave...concerned about the sewer main being plugged running from East Ave down the hill. Her neighbors at 329 and 315 have had P & P septic over for sewer back ups in the last few weeks and the cameras didn't find anything in the service lines.	Colchester Ave	4/17/2009	ROW - Streets	Investigatio	N/A
SR # 9680 having trouble with her sewer line, requesting to TV the line. Nancy called 6/9/09 said that they are tv'ing the line heading down Colchester Ave (the wrong way from where she needs it done) She spoke with Steve G, Bill P told Dicky to schedule this request	339 Colchester Ave	6/12/2009	ROW - Streets	Complete	N/A
Possible Sewer plug	College & Church	12/31/2002	ROW - Streets	Complete	N/A

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Possible sewer plug.	160 College St	10/22/2002	ROW - Streets	Complete	Customer
SR # 9893 possible sewer plug	298 College St	8/12/2009	ROW - Streets	Complete	
RSN 9875 on 8/6/09 @ 11:17 a.m. Had called and stated that they had sewer back up in the building on June 30th and July 1st. Would like someone to look at the lines	298 College Street	8/6/2009	ROW - Streets	Complete	N/A
Sewer plug. Affected more than one location. Number unknown.	74 Conger Ave.	1/6/2004	ROW - Streets	Complete	N/A
possible sewer plug	36 Conger Ave	3/21/2005	ROW - Streets	Complete	Customer
basement is backing up, asking us to drain cap and suck the stuff out. 12:30. Mark said the water is not backing up into the houses, visually. I asked him to check our line of the sewer.	Conger Ave & Harrison Ave off Lakeside	11/20/2003	ROW - Streets	Complete	
Possible sewer plug -11:00 am	58 Cross Parkway	2/25/2005	ROW - Streets	Complete	N/A
SR#6418 Possible sewer plug. called in at 1:43pm	71 Cross Parkway	8/8/2006	ROW - Streets	Complete	Customer

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#7228 Possible sewer plug (10:00 am)	21 Cross Parkway	5/17/2007	ROW - Streets	Complete	N/A
SR#8455 Possible sewer plug 1:19 pm	58 Cross Parkway	6/4/2008	ROW - Streets	Complete	N/A
Sewer plug.	95 Dale Rd.	11/17/2003	ROW - Streets	Complete	Customer
possible sewer plug - between Willard & Prospect	14 Dan's Court	11/12/2003	ROW - Streets	Complete	
Possible sewer plug 9:55 a.m.	96 Deforest Heights	2/26/2004	ROW - Streets	Complete	N/A
SR#7886 Possible sewer plug 3:23pm	14 Dewey Dr	12/27/2007	ROW - Streets	Complete	N/A
Owner having problems with a pump station on her property. Need to know who owns the pump? Sewer always backs up after a rain storm and owner is worried that the back up pump is not working. Do we monitor the alarm to the pump?	14 Dorset Lane	10/25/2002	Division Head	Complete	
SR # 9967 possible sewer plug	33 Drew St	9/8/2009	ROW - Streets	Complete	

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#6863 possible sewer plug called into Mark at 9:05	10 Dunder Rd	1/23/2007	ROW - Streets	Complete	
Possible sewer plug. am	18 East Ave	8/18/2003	ROW - Streets	Complete	
SR#8177 Possible sewer plug 2:06pm Roto Rooter has been cutting through roots.....	102 East Ave	4/4/2008	ROW - Streets	Complete	N/A
SR # 5648 Possible sewer plug. 9:10 am	19 Eastman Farm Rd.	12/27/2005	ROW - Streets	Complete	Customer
SR # 7828 possible sewer plug 1:20	95 Edgemore Dr	12/10/2007	ROW - Streets	Complete	
SR#7834 Possible sewer plug - customer walked in and let us know that he had a plug. (9:38 am)	95 Edgemore Dr	12/12/2007	ROW - Streets	Complete	N/A
SR # 7854 possible sewer plug.	46 Edgewood Lane	12/18/2007	ROW - Streets	Complete	Customer
possible sewer plug. 3:30	18 Elm Terrace	2/11/2005	ROW - Streets	Complete	Customer

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#9618 Possible sewer plug 10:03 am	34 Elm Terrace	5/26/2009	ROW - Streets	Investigatio	Pending
Possible sewer plug 12:41 p.m. called into Dan	67 Elmwood Ave	6/4/2003	ROW - Streets	Complete	N/A
SR#6999 Customer called at 9:15 stating that there was a sewer break about 90 ft out.	101 Elmwood Ave	3/22/2007	ROW - Streets	Complete	
SR#7701 (71 Elmwood & 89 Peru ST) Possible sewer plug 11:47 am	71 Elmwood & 89 Peru St	10/25/2007	ROW - Streets	Complete	N/A
Customer says she has Roto Rooter at her house, and they said the city's sewer line appeared to be blocked. She says there is sewage flowing into her basement. She called at 10:29AM	134 Ethan Allen Parkway	6/22/2005	ROW - Streets	Complete	Customer
Possible sewer plug called in on 7/2/2003 at 9:30 p.m.	276 Ethan Allen Pkwy	7/3/2003	ROW - Streets	Complete	N/A
SR#6050 Possible sewer plug 3:54pm - Water backing up into basement.	272 Ethan Allen Pkwy	5/19/2006	ROW - Streets	Complete	Customer
SR#6393 Terri from water called to let us know (10:20 AM) that the customer thought he had a water break. she sent a trouble shooter to find out that it was sewer water. Called into Dan Owner is Gardner Hopwood - 658-6705 -	355 Ethan Allen Pkwy	8/2/2006	ROW - Streets	Complete	N/A
10/21/2009					

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 6998 Possible sewer plug 2:15pm	272 Ethan Allen Pkwy	3/22/2007	ROW - Streets	Complete	N/A
Possible sewer plug/leak - left on Streets answering machine 6/17/05 at 5:49 pm.	392 ethan Allen Pkwy #2	6/20/2005	ROW - Streets	Complete	N/A
SR#8473 Possible sewer plug (9:17 a.m.)	Fairfield Drive	6/9/2008	ROW - Streets	Complete	N/A
Possible sewer plug.	Fairfield Dr & North Ave	2/21/2003	ROW - Streets	Complete	N/A
possible sewer plug. 10:40	71 Fairmont Pl	1/26/2005	ROW - Streets	Complete	
>>> Norm Baldwin 8/8/2005 1:53:49 PM >>> Dan & Bill, I received a call from a Mr. Tim Dempsey (781) 710-4802. He owns a house at 42 Fairmount Street. He claims he has had flooding in his cellar, which is a finished basement. He claims he has owned the home for 50 years, and has never had a problem, and in checking with hsi neighbors, he was aware of a property having some alterations to their connection (The Veraconi's?). It is his belief there	42 Fairmount St	8/8/2005	ROW - Streets	Complete	N/A
Possible sewer plug, due to smell. 9:00	59 Faith St	9/29/2004	ROW - Streets	Complete	Customer
Possible Sewer Plug (9:00 a.m.)	10 Farrington Pkwy	11/30/2001	ROW - Streets	Complete	N/A

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 7082 possible sewer plug 9:15	33 Farrington pkwy	4/16/2007	ROW - Streets	Complete	Customer
possible sewer plug called into Dicky 2:00	10 Farrington pkwy	7/10/2007	ROW - Streets	Complete	N/A
SR#7762 possible sewer plug called into Dicky 9:48	10 Farrington pkwy	11/8/2007	ROW - Streets	Complete	Customer
SR#7805 possible sewer plug (Customer walked in Customer Service)9:43am	10 Farrington pkwy	11/26/2007	ROW - Streets	Complete	Customer
Possible sewer plug 1:55 pm	44 Ferguson Ave	11/19/2002	ROW - Streets	Complete	N/A
possible sewer plug (there is a sinkhole over the service)	108 Ferguson Ave	6/15/2006	ROW - Streets	Complete	Customer
sewer plug told Danny 11:15	Fletcher Place	5/27/2005	ROW - Streets	Complete	N/A
Possible sewer plug called in at 9:44 am	379 Flynn Ave	11/18/2002	ROW - Streets	Complete	N/A

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Possible sewer plug. Customer is home.	371 Flynn Ave	4/1/2003	ROW - Streets	Complete	N/A
Possible sewer plug. called in at 8:55 a.m.	425 Flynn Ave	1/26/2004	ROW - Streets	Complete	Customer
possible sewer plug - 10:00 (334-336)	334-336 Flynn Ave	4/22/2004	ROW - Streets	Complete	Customer
Possible sewer plug called in at 3:50 p.m.	379 Flynn Ave	7/2/2004	ROW - Streets	Complete	Customer
SR # 5710 Mary left message: Possible sewer plug called in to Dan at 10:55 a.m.	379 Flynn Ave	1/19/2006	ROW - Streets	Complete	Customer
RSN 9010 Sewer backing up into cellar	371 Flynn Avenue	11/6/2008	ROW - Streets	Complete	N/A
Possible sewer plug or broken line -9:15 am	Franklin Sq	4/11/2005	ROW - Streets	Complete	N/A
SR#6967 Tenant called to say that 2 of the houses had possible sewer plugs. (9:00am.)	Front St & Summer St	3/14/2007	ROW - Streets	Complete	N/A

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 5911 possible sewer plug. called into Dan 12:30	92 Gazo Av	4/14/2006	ROW - Streets	Complete	
Possible sewer plug at above location. Customer said water was coming in the line to her washer. Contacted Dan Hill to verify situation.	257 Gazo Ave	7/9/2003	ROW - Streets	Complete	N/A
SR#6461 Possible sewer plug called in at 3:58pm	105 Gazo Ave	8/21/2006	ROW - Streets	Complete	N/A
SR#9161 Sewer plug on Friday afternoon - customer never called us till today at 11:31 am. Told him we would check our line (roto router auggered 70 ft)	232 Gazo Ave	12/29/2008	ROW - Streets	Complete	N/A
RSN 8957 Possible sewer plug	152 Gazo Avenue	10/17/2008	ROW - Streets	Complete	N/A
Possible sewer plug	70 George St	2/4/2002	ROW - Streets	Complete	N/A
Allans is repairs the sewer pipe and popped our manhole, said line is plugged tight!	Glen Rd - sewer line	11/20/2006	ROW - Streets	Complete	Customer
Sewer line/ Manhole plugged. called twice today - this morning/our line is fine.. this afternoon we unplugged our line.	82 Green Acres Dr.	1/7/2003	ROW - Streets	Complete	Customer

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 5964 Sewer line/ Manhole plugged.	82 Green Acres Dr	5/1/2006	ROW - Streets	Complete	N/A
SR # 7963 Sewer line/ Manhole plugged.	82 Green Acres Dr	1/31/2008	ROW - Streets	Complete	Customer
Sewer line/ Manhole plugged.	Green Acres Dr.	3/15/2001	ROW - Streets	Complete	
Sewer line/ Manhole plugged.	Green Acres Dr.	11/26/2002	ROW - Streets	Complete	Customer
Possible sewer plug. 9:25 am	75 Green Acres Dr	7/29/2003	ROW - Streets	Complete	
Possible sewer plug 2:00 pm-	65 Green Acres Dr	6/25/2004	ROW - Streets	Complete	N/A
Possible sewer plug - 12:15 pm	75 Green Acres Dr	6/1/2005	ROW - Streets	Complete	N/A
Possible sewer plug - 9:38am	75 Green Acres Dr	10/18/2005	ROW - Streets	Complete	Customer



CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 5796 Possible sewer plug - 10:00	75 Green Acres Dr	3/1/2006	ROW - Streets	Complete	N/A
Possible sewer plug 8:40 am	55 Greene St	12/22/2003	ROW - Streets	Complete	N/A
Possible sewer plug. 8:20 am	21 Grove St	11/6/2002	ROW - Streets	Complete	N/A
Possible sewer plug.	22 Grove St	3/27/2003	ROW - Streets	Complete	
sewer plug.	26 grove st.	2/8/2005	ROW - Streets	Complete	Customer
Possible sewer plug - 4:11	120 Hardy Ave	11/26/2003	ROW - Streets	Complete	Customer
SR# 5632 Possible sewer plug 1:15 pm	90 Hardy Ave	12/15/2005	ROW - Streets	Complete	N/A
SR#6917 Possible sewer plug 1:24pm- called into Dick	4 Haswell St	2/17/2007	ROW - Streets	Complete	N/A

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Sewer odor in House Carol Duncan spoke to customer, she said to check with Bill Paquette to see if the guys checked this out on Tuesday. If so, please call her to tell her if the sewer line is ok.	117 Hayward St	9/13/2001	ROW - Streets	Complete	Customer
Possible sewer plug. Customer is getting strong sewer smell. called out 12:20 p.m.	117 Hayward St	11/4/2002	ROW - Streets	Complete	N/A
Sewer smell in basement - send vactor out to check for potential sewer plug..	117 Hayward St.	10/23/2003	ROW - Streets	Complete	Customer
SR#6824 Possible sewer plug - called in to waste water- 12:30pm	108 Hayward St	1/9/2007	ROW - Streets	Complete	N/A
possible sewer plug 9:55	21 Henderson Terrace	10/1/2007	ROW - Streets	Complete	
SR # 7789 possible sewer plug rained today 11/15/07	48 Henderson Terrace	11/15/2007	ROW - Streets	Complete	Customer
Possible sewer plug.	74 Henry St	3/19/2003	ROW - Streets	Complete	
Possible sewer plug 8:00 am	141 Home Ave	8/10/2004	ROW - Streets	Complete	Customer

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Check for sewer plug and also check the storm drain to see if clear.	95 Home Ave.	9/8/2004	ROW - Streets	Complete	Customer
Possible sewer plug 3:55 pm	141 Home Ave	9/29/2005	ROW - Streets	Complete	Customer
Sewer plug.	Hope St.	12/12/2001	ROW - Streets	Complete	Customer
possible sewer plug 10:22 a.m.	38 Hope St	2/26/2008	ROW - Streets	Complete	Customer
SR # 8134 possible sewer plug, called into Dicky	46 Hope St	3/25/2008	ROW - Streets	Complete	
Possible sewer plug.	65 Howard	3/16/2001	ROW - Streets	Complete	Customer
Possible sewer plug.	184 Howard St	12/5/2001	ROW - Streets	Complete	N/A
SR # 7951 Possible sewer plug 1:10 called into Dicky	70-72 Howard St	1/23/2008	ROW - Streets	Complete	Customer

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Possible sewer plug	20 Hungerford Terrace	11/4/2002	ROW - Streets	Complete	N/A
Possible sewer plug	83 Hyde St	8/12/2002	ROW - Streets	Complete	N/A
SR # 7083 possible sewer plug 2:30	80 Industrial Pkwy	4/16/2007	ROW - Streets	Complete	Customer
6 Foot wide puddle of sewer leaking in field behind school. They have had Roto Rooter there 2 times. not their lines. Left 1st message on street phone at 7:37am. called in at 8:08. sent Dan Hill	Institute Rd- Rock Point School	10/5/2005	ROW - Streets	Complete	N/A
Possible sewer plug	39 Intervale Ave	1/29/2002	ROW - Streets	Complete	N/A
Possible sewer plug.	57 Intervale Ave	3/19/2002	ROW - Streets	Complete	Customer
Possible sewer plug.	1 Ivy Lane	2/26/2003	ROW - Streets	Complete	N/A
Possible sewer plug called in by Lyndol 9:30 a.m.	200 Jackson Ct	8/4/2003	ROW - Streets	Complete	N/A

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Customer called answering service 4/27/05 to call in possible sewer plug. Bernie went and checked manholes- our line is fine. Customer called back in this morning - Dan sent Bernie out with vactor - Bernie ran line 570 feet one way and 500 the other - our line is fine. 12:50	75 James Ave	4/28/2005	ROW - Streets	Complete	N/A
SR#8261 Possible sewer plug called in by Rosie from St. Cyr Plumbing 864-0505 at 11:16am	98 James Ave	4/23/2008	ROW - Streets	Complete	N/A
Customer's water & sewer is not draining to street. Please check our line to see if there is a plug (2:25)	Kilburn St	8/17/2004	ROW - Streets	Complete	N/A
Possible sewer plug. They were augering and there was water coming back up in the sewer line when no one was running the water.	211 Killarney Dr	1/13/2003	ROW - Streets	Complete	
Possible sewer plug. 8:05 a.m. called again 10/1/03 -lh - spoke to Dan	211 Killarney Dr	9/30/2003	ROW - Streets	Complete	Customer
possible sewer plug. Called into Dicky, he said we had just flushed and camera'd the line, knows its not plugged, but had Charlie look at it anyways.	26 Killarney Dr	8/17/2007	ROW - Streets	Complete	Customer
Possible sewer plug 12:01 pm Very bad sewer smell.	87 King St	3/18/2005	ROW - Streets	Complete	N/A
SR#6709 possible sewer plug. Toilet is backing up.	49 King St	5/10/2007	ROW - Streets	Complete	

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#8521 Possible sewer plug 4:18pm	King St	6/23/2008	ROW - Streets	Complete	N/A
SR # 5916 possible sewer plug	32 Kingsland Terrace	4/17/2006	ROW - Streets	Complete	Customer
SR#6094 Possible sewer plug - called into Bill P at 2:59pm	32 Lakeside Ave	5/30/2006	ROW - Streets	Complete	N/A
SR#6153 Possible sewer plug - called into Dan H 8:05am	32 Lakeside Ave	6/9/2006	ROW - Streets	Complete	N/A
SR#7214 Possible sewer plug 10:06 am - Called into Dick	107 Lakeview Terr	5/14/2007	ROW - Streets	Complete	Customer
SR#7294 Possible sewer plug - message left on streets	107 Lakeview Terr	6/6/2007	ROW - Streets	Complete	N/A
Potential sewer plug.	Lakeview Terr	12/21/2001	ROW - Streets	Complete	Customer
Possible sewer plug	23 Lakeview Terrace	7/19/2006	ROW - Streets	Complete	

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Sewer backing up again, last time they called Roto-rooter and wasn't there problem, we went out and pumped the sewer out, in the front and it was fine.	48 Lakewood Pkwy	12/24/2002	ROW - Streets	Complete	
Sewer backed up on 3/7/05- customer called the TTY phone number all day. Called this morning 8:57 am - gave info to Dan-	48 Lakewood Pkwy/North Ave	3/8/2005	ROW - Streets	Complete	N/A
Sewer plug.	105 Lakewood Pkwy.	4/21/2005	ROW - Streets	Complete	Customer
SR # 9201 possible sewer plug	50 Lakewood Pkwy	1/12/2009	ROW - Streets	Complete	Customer
RSN 9277 @ 2:34 Called to say there was an odor in her basement. Couple moths ago we were out there and there was a sewer plug, was taken care of	50 Lakewood PW	2/20/2009	ROW - Streets	Investigatio	Pending
SR # 5947 possible sewer plug	32 Laurel Ct	4/26/2006	ROW - Streets	Complete	N/A
SR # 5961 possible sewer plug	32 Laurel Ct	5/1/2006	ROW - Streets	Complete	
Sewer plug.	104 Ledge Rd.	3/30/2005	ROW - Streets	Complete	Customer

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#8578 Possible sewer plug 10:27am	35 Ledge Rd	7/10/2008	ROW - Streets	Complete	N/A
SR#9857 Possible sewer plug 12:55 pm	68 Ledge Rd	8/3/2009	ROW - Streets	Complete	N/A
Possible sewer plug.	37 Leonard St	8/1/2001	ROW - Streets	Complete	
Possible sewer plug.	25 Leonard St	12/19/2001	ROW - Streets	Complete	N/A
Possible sewer plug.	108 Loaldo Dr.	12/21/2000	ROW - Streets	Complete	
Sewer plug.	102 Loaldo Dr.	2/12/2004	ROW - Streets	Complete	Customer
Possible sewer plug - customer concerned that sump pump is not draining 6/20/05 - 8:08am	161 Locust St	6/20/2005	ROW - Streets	Complete	N/A
possible sewer plug	189 Locust Terrace	11/12/2003	ROW - Streets	Complete	

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
had sewer coming out of toilet and shower. from hard rain storm 7/9/07	172 Locust Terrace	7/10/2007	ROW - Streets	Complete	
SR#8545 Possible plugged sewer.....3:04pm (storm Sunday Night)	178 Locust Terrace	6/26/2008	ROW - Streets	Complete	N/A
Possible sewer plug	4 Loomis St	12/11/2002	ROW - Streets	Complete	N/A
Sewer plug.	121 Lopes Ave.	5/4/2004	ROW - Streets	Complete	Customer
Sewer not draining SR 8514 6/23/08 @11:17 a.m.	Colchester Ave	6/23/2008	ROW - Streets	Complete	N/A
SR#8710 Possible sewer plug 2:36pm	44 Luck St	8/6/2008	ROW - Streets	Complete	N/A
SR#8795 possible sewer plug 1:52 pm	25 Luck St	8/29/2008	ROW - Streets	Complete	N/A
RSN 8755 Possible blocked sewer line	44 Luck Street	8/20/2008	ROW - Streets	Complete	N/A

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 9687 Possible sewer plug 1:30	131 Lyman Ave	6/15/2009	ROW - Streets	Complete	Customer
Possible sewer plug.	181 Lyman Ave	5/22/2002	ROW - Streets	Complete	Customer
Possible sewer plug	15 Lyman Ave	2/3/2003	ROW - Streets	Complete	N/A
Possible sewer plug, called in 12:40 Dan	49 Lyman Ave	1/6/2004	ROW - Streets	Complete	
Possible sewer plug 4:00 pm	61 Lyman Ave	9/28/2004	ROW - Streets	Complete	N/A
Customer called at 1:11 to say he had sewer backing up in his basement.	25 Lyman Ave	10/26/2005	ROW - Streets	Complete	N/A
SR#7476 Possible sewer plug left on streets voice mail.	168 Lyman Ave	8/8/2007	ROW - Streets	Complete	N/A
Possible sewer plug - heavy rain today	67 Main St	7/19/2005	ROW - Streets	Complete	Customer

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 9484 across the street from the Dudley Davis building, corner of University Tr. possible sewer plug, backed up during the night and now he has twigs and evergreen in his toilet.	565 Main St	4/23/2009	ROW - Streets	Investigatio	Customer
SR#7975 Possible sewer plug @ 12:32pm, 1st time. also occured around the super bowl - on a Sunday (which was not during regular hours, so i am just making a note that this is the 2nd time. see Request # 8149 for 3rd time.	77 Manhattan Dr	2/5/2008	ROW - Streets	Complete	N/A
SR#7976 Possible sewer plug @ 3:03pm	103 Manhattan Dr	2/5/2008	ROW - Streets	Complete	N/A
SR # 8149 Possible sewer plug @ 12:15pm, 3rd time.	77 Manhattan Dr	3/27/2008	ROW - Streets	Complete	
SR#6494 Customer called beacuse of slow draining sewer. Her line was plugged with roots at the main and there is a dip in her service.	137 Mansfield Ave	9/1/2006	ROW - Streets	Complete	N/A
on Maple Street between Summit & South Willard, next to the Hauke building. Possible sewer plug. 8:50 am	Maple ST	4/13/2004	ROW - Streets	Complete	N/A
SR#5693 Possible sewer plug - Roto Rooter ran the line 70 feet. says its our problem. 9:30 am	390 Maple St	1/18/2006	ROW - Streets	Complete	
SR # 6876 possible sewer plug	Maple St & Battery St	1/29/2007	ROW - Streets	Complete	

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Possible sewer plug 12:11 am	42 Marble Ave	11/17/2004	ROW - Streets	Complete	N/A
Possible sewer plug	30 Marshall Dr	2/7/2002	ROW - Streets	Complete	N/A
Possible sewer plug 9:10 a.m. Called into Mark	42 Meridian St	8/24/2004	ROW - Streets	Complete	Customer
possible sewer plug - she had rotoooter come and check out her line, there were tree limbs in it. They referred her to us and I explained that we would just check our line to make sure it was flowing fine. Called into Danny at 8:45am	50 Morgan St.	12/1/2003	ROW - Streets	Complete	Customer
SR#6750 possible sewer plug called in at 10:48am. P&P Septic is replacing a sewer line and said our line is plugged.	44 Morgan St	11/30/2006	ROW - Streets	Complete	N/A
Possible sewer plug called in at 9:15.	18 Morse Pl	5/20/2004	ROW - Streets	Complete	N/A
Possible sewer plug	18 Morse Pl	4/16/2007	ROW - Streets	Complete	N/A
Possible sewer plug. Called streets on two-way radio.	18 Morse Pl #a	3/12/2004	ROW - Streets	Complete	

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#8037 Possible sewer plug 1:25 pm	5-7 Murray St	2/29/2008	ROW - Streets	Complete	N/A
Possible sewer plug	89 N Champlain St	12/24/2001	ROW - Streets	Complete	N/A
possible sewer plug. 8:15	227 N Willard Street	5/21/2003	ROW - Streets	Complete	
Possible sewer plug	123 N Winooski Ave	3/10/2003	ROW - Streets	Complete	N/A
sink hole in the greenbelt, she said it's very deep, she went to the hip and she is a tall person. Also, please check the sewer line and make sure it's flowing fine.	402 North Ave	5/3/2002	ROW - Streets	Complete	Customer
Possible sewer plug. Customer's plumber is already out 75 feet. 3:57 pm	1634 North Ave	1/17/2003	ROW - Streets	Complete	N/A
Possible sewer plug 5:30 p.m.	1136 North Ave	5/19/2003	ROW - Streets	Complete	N/A
Possible sewer plug. 9:30 a.m.	745 North Ave	6/30/2003	ROW - Streets	Complete	N/A

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Possible sewer plug - 10:45 a.m.	1447 North Ave	12/2/2003	ROW - Streets	Complete	Customer
Possible sewer plug.	2035 North Ave	4/23/2004	ROW - Streets	Complete	N/A
sewer plug	1073 north ave.	3/8/2005	ROW - Streets	Complete	Customer
SR#6747 Possible sewer plug- called in at 10:00	56 North Ave	11/29/2006	ROW - Streets	Complete	Customer
SR#7209 Possible sewer plug (2:09 pm)	1685 North Ave	5/11/2007	ROW - Streets	Complete	N/A
SR#7739 Possible sewer plug (10:51 a.m.)	1448 North Ave	11/5/2007	ROW - Streets	Complete	N/A
SR#8680 Possible sewer plug (3:19pm)	258 North Ave	7/30/2008	ROW - Streets	Complete	N/A
SR#8762 Possible sewer plug 10:50 am	1850 North Ave	8/20/2008	ROW - Streets	Complete	N/A

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 8224 Possible sewer plug 8:25 a.m.	1375 North Ave	4/15/2008	ROW - Streets	Complete	
SR # 8981 possible sewer plug	1231 North Avenue	10/28/2008	ROW - Streets	Investigatio	
Possible sewer plug.	245 North Champlain St	5/14/2003	ROW - Streets	Complete	N/A
SR#7210 Possible sewer plug (2:51 pm)	240 North Champlain St	5/11/2007	ROW - Streets	Complete	N/A
SR#6814 possible sewer plug (2:32pm) Customer came down 1/3/07 with a tape from Roto Rooter for Mark to view. We will be filming the line hopefully by Friday.	119 North Prospect St	1/2/2007	ROW - Streets	Complete	N/A
Potential sewer plug.	70 North St.	10/23/2003	ROW - Streets	Complete	Customer
possible sewer plug, basement flooded. 10:00	180 North St	12/26/2006	ROW - Streets	Complete	Customer
Possible sewer plug.	188 N Willard St	6/18/2002	ROW - Streets	Complete	Customer



CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Possible sewer plug.	34 North Williams St	1/15/2004	ROW - Streets	Complete	Customer
SR#7461 Possible sewer plug 8:23am Sewage flooding entire building through all apts----Landlord not doing anything about it.	221 North Winooski Ave	7/27/2007	ROW - Streets	Complete	N/A
Sewer plug.	Northfield Dr.	2/25/2004	ROW - Streets	Complete	Customer
Sewer plug.	20 Oak St.	7/30/2003	ROW - Streets	Complete	Customer
Possible sewer plug.	75 Orchard Terr	10/4/2001	ROW - Streets	Complete	N/A
Sewer plug.	37 Orchard Tr	10/8/2003	ROW - Streets	Complete	Customer
Possible sewer plug -9:05 am	37 Orchard Terrace	6/13/2004	ROW - Streets	Complete	N/A
storm water coming in, please check sewer was during a heavy rain storm..	45 Overlake Pk	11/4/2003	ROW - Streets	Complete	

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#6593 Possible sewer plug! 1:15pm Owner called right back and had Larry from Roto Rooter talk to me - said the plug is between manholes - 1:47pm	92 Overlake Pk	10/12/2006	ROW - Streets	Complete	N/A
SR#7033 Possible sewer plug - (collection basin is plugged) 2:45 p.m.	97 Overlake Pk	3/30/2007	ROW - Streets	Complete	N/A
SR#7914 left voice mail for Norm, forward to Dicky via this service request. sewer keep backing up, wants long-term solution (last one occurred the 21st. ?? not in our system, last one was in March according to our records) Possible sewer plug.	97 Overlake Pk	1/9/2008	ROW - Streets	Complete	N/A
	200 Park St.	2/28/2001	ROW - Streets	Complete	
SR#6418 Possible sewer plug called in to Dicky around 9:15 am	46, 48, 50 Park St	3/5/2007	ROW - Streets	Complete	Customer
SR#7748 (46-50) Possible sewer plug called into Dick at 2:20 pm(customer snaked out to rd- says line is broken)	46 - 50 park St	11/6/2007	ROW - Streets	Complete	N/A
SR#7285 Customer states that the catch basin is plugged with leaves and dirt. Everytime this happens he gets sewer in his basement. Please clean out.	Park St & North St	6/5/2007	ROW - Streets	Complete	N/A
Possible sewer plug	Pearl & Battery (corner of)	5/8/2003	ROW - Streets	Complete	N/A

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Possible sewer plug	90 Pearl St	8/14/2002	ROW - Streets	Complete	Customer
Phone call received today at 9:10am. Customer had a sewer back up late morning of 3/24/05 - they called Roto Rooter but not DPW. Roto said that the plug was 45-55 Feet out and cleared the line. Customer is calling today to document call for insurance purposes- spoke to Dan Hill after.	177 Pearl St	3/29/2005	ROW - Streets	Complete	N/A
SR#8370 Possible sewer Plug	300 Pearl St	5/13/2008	ROW - Streets	Complete	N/A
RSN 8930 Possible sewer plug	90 Pearl Street	10/7/2008	ROW - Streets	Complete	N/A
Possible sewer plug:	52 Peru St	5/12/2003	ROW - Streets	Complete	
Terri Boylan called into Dicky on 5/11/03					
SR # 5933 Possible sewer plug. 2:05 pm	79 Peru St	4/20/2006	ROW - Streets	Complete	N/A
SR#6026 Customer had a sewer plug back in April - His line is flowing slow and wants us to TV the line. He said it is full of roots.	79 Peru St	5/15/2006	ROW - Streets	Complete	Customer
SR#9679 Possible sewer plug - customer waited to call because she had her lines snaked by roto router - 2:33 pm	52 Peru St	6/12/2009	ROW - Streets	Complete	N/A

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#9729 possible sewer plug 4:01pm	83 Peru St	6/25/2009	ROW - Streets	Complete	N/A
Sewer plug.	23 Pine Pl	11/5/2003	ROW - Streets	Complete	Customer
Possible sewer plug. Customer has had a plumber / roto rooter? at the property already. Still experiencing problems.	240 Pine St	1/23/2003	ROW - Streets	Complete	N/A
Sewer plug.	960 Pine St.	10/8/2003	ROW - Streets	Complete	Customer
Possible sewer plug 1:14 p.m.	750 Pine St	2/27/2004	ROW - Streets	Complete	Customer
Possible sewer plug 9:30 a.m.	817 Pine St	3/1/2004	ROW - Streets	Complete	N/A
SR#6789 Customer walked in to let us know his sewer line is plugged. (8:50)	339 Pine St	12/15/2006	ROW - Streets	Complete	N/A
SR#7363 Sewer plug 12:16pm	750 Pine St	7/9/2007	ROW - Streets	Complete	N/A

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 8365 Possible sewer plug, resident smells sewer gas	221 Pine St	5/14/2008	ROW - Streets	Complete	Customer
SR#8520 Possible sewer plug @ 3:34pm	405 Pine St	6/23/2008	ROW - Streets	Complete	N/A
SR#8035 Possible sewer plug 8:56am *****Call received 2/18/08 (holiday) Brian & Mark went - our line was fine then too!	61 Pitkin St	2/29/2008	ROW - Streets	Complete	N/A
RSN 9447 on 4/16/09 @ 8:04 Sewer plug, basement flooded, water not draining in sinks.	73 Pitkin Street	4/16/2009	ROW - Streets	Complete	N/A
Possible sewer plug	272 Plattsburg Ave	2/25/2002	ROW - Streets	Complete	N/A
SR#7161 Possible sewer plug - called into Dick at 11:27 am	126 Pleasant Ave	5/1/2007	ROW - Streets	Complete	N/A
SR#7646 Possible sewer plug 10:13 am	95 Pleasant Ave	10/1/2007	ROW - Streets	Complete	N/A
SR # 9737 2nd turn off from Starr Farm: possible sewer plug	203 Pleasant Ave	6/29/2009	ROW - Streets	Complete	Customer

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
RSN 9747 on 7/2/09 @ 1:12 p.m. Five or so houses are experiencing slow draining from their house. Catch basin needs to be cleaned out. Bill Paquette said he would do something and no one has shown up. Starting to smell. Agnus called again 2:00. I sent Dickv down to check it out.	Pleasant Avenue	7/2/2009	ROW - Streets	Complete	N/A
Sewer Plug.	198 Pleasant	9/15/2003	ROW - Streets	Complete	Customer
sewer plug	71 Poirier pl	10/17/2003	ROW - Streets	Complete	Customer
possible sewer plug.	27 Poirier pl	12/28/2005	ROW - Streets	Complete	
SR#8912 - Voice Mail Left on DPW at 4:50 p.m. Possible sewer plug	40 Prospect Hill	10/2/2008	ROW - Streets	Complete	N/A
SR#9653 Possible sewer plug 2:45pm	60 Prospect Parkway	6/4/2009	ROW - Streets	Complete	N/A
Possible sewer plug.	378 Queen City Park RD	11/13/2002	ROW - Streets	Complete	N/A
Very strong sewer smell. Customer worried that sewer line will back up	109 Randy Lane	12/13/2002	ROW - Streets	Complete	N/A

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 7732 Very strong sewer smell. And started to back-up in the downstairs	33 Randy Lane	11/2/2007	ROW - Streets	Complete	
RSN 9411 on 4/8/09 @ 10:30 Water in cellar from toilet and shower, possible sewer plug	9 Revere Court	4/8/2009	ROW - Streets	Complete	Work not done
Customer has sewer water backing up into their basement. Called out crew.	137 Richardson St	3/12/2003	ROW - Streets	Complete	Pending
Possible sewer plug 1:55 p.m.	137 Richardson St.	5/19/2004	ROW - Streets	Complete	Customer
Sewer plug.	80 Rivermount Terr	2/12/2001	ROW - Streets	Complete	
Possible sewer plug	74 Rivermount Terr	3/12/2003	ROW - Streets	Complete	Customer
Possible sewer plug.	74 Rivermount Terr	5/21/2003	ROW - Streets	Complete	Customer
SR#5784 Possible sewer plug - called in by customer at 9:23 am.	80 Rivermount Terr	2/24/2006	ROW - Streets	Complete	Customer

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#7869 Possible sewer plug - called in by customer at 8:29am.	80 Rivermount Terr	12/26/2007	ROW - Streets	Complete	Customer
SR#7953 Possible frozen sewer lin (10:46 am)	80 Rivermount Terrace	1/24/2008	ROW - Streets	Complete	N/A
SR#10087 Possible sewer plug 10:37 am	80 Rivermount Terrace	10/7/2009	ROW - Streets	Complete	N/A
Possible sewer plug. Needs to have our line checked. (105-107) Please check catch basins at the intersection of Rivers Edge Dr & Plattsburg Ave	Rivers Edge Dr	5/2/2001	ROW - Streets	Complete	Customer
Possible sewer plug. Roto Rooter already went in 40 feet with no problems.	366 Riverside Ave	9/7/2001	ROW - Streets	Complete	N/A
Possible sewer plug.	365 Riverside Ave	3/11/2003	ROW - Streets	Complete	
Possible sewer plug.	Riverside Ave	1/30/2004	ROW - Streets	Complete	
SR#6311 Possible sewer plug called into Steve G at 12:12pm	Riverside Ave	7/12/2006	ROW - Streets	Complete	N/A

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#6341 Possible sewer plug called in at 9:17 am	Riverside Ave	7/20/2006	ROW - Streets	Complete	N/A
SR#7874 Possible sewer plug 10:38 am	125 Robinson PkWy	12/26/2007	ROW - Streets	Complete	N/A
SR#7906 Possible sewer plug 9:22 am	125 Robinson PkWy	1/8/2008	ROW - Streets	Complete	Customer
SR # 8888 Possible sewer plug, left message on voicemail 9/28/08 6:55 p.m. Ruth left message and emailed that her sewer is backing up again in her basement on 10/4/08	125 Robinson PkWy	9/29/2008	ROW - Streets	Investigatio	
SR # 9975 possible sewer plug. A tenants father called and said the toilet was plugged he was wonder since there was work being done on the street if that had something to do with the sewer.	50 Robinson Pkwy	9/9/2009	ROW - Streets	Complete	Customer
Possible sewer plug. 10:20	21 Roseade Pkwy	1/27/2009	ROW - Streets	Investigatio	
possible sewer plug	21 Russell Street	12/31/2003	ROW - Streets	Complete	
#8543 Possible sewer plug 2:06pm	25 Russell St	6/26/2008	ROW - Streets	Complete	N/A

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
possible sewer plug	189 S Champlain St	11/4/2003	ROW - Streets	Complete	
Sewer back up. Dan H. checked and said our line fine.	273 S. Prospect St.	9/3/2004	ROW - Streets	Complete	N/A
Possible sewer plug	316 S Willard St	11/15/2004	ROW - Streets	Complete	
Possible sewer plug called in at 9:30 am.	37 S Williams #313	9/20/2002	ROW - Streets	Complete	N/A
SR#7923 Possible sewer plug 8:35 am	92 Sandra Circle	1/14/2008	ROW - Streets	Complete	N/A
RSN 9320 on 3/9/09 @ 2:29 p.m. Possible sewer plug, toilet flushing slow	100 Saratoga Ave	3/9/2009	ROW - Streets	Complete	Customer
SR # 6079 (30-32) Please check sewer line for possible plug. No rush. Customer has problems with backups when it rains..... Thanks	30-32 School St	5/25/2006	ROW - Streets	Complete	N/A
SR#7907 Possible sewer plug. 1:29pm	430 Shelburne Rd	1/8/2008	ROW - Streets	Complete	N/A

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#9234 Possible sewer plug 8:15 am	136 Shelburne Rd	2/2/2009	ROW - Streets	Complete	N/A
Possible sewer plug - please check out.	Shelburne St.	11/6/2001	ROW - Streets	Complete	N/A
Customer called in to say that sewer line still seemed to be plugged. Bernie checked on 7/4/05 pm and line was fine. Customer called in again on 7/5/05 8:16 am to say that line was still plugged.	185 Shore Rd	7/5/2005	ROW - Streets	Complete	N/A
SR #5614 Possible sewer plug. 10:53 am called into Dan H.	88 Shore Rd	12/7/2005	ROW - Streets	Complete	N/A
Flooding and sewer back up on Friday night 9/27/02 Terry Goodrich went to pump station to check pumps at 9:00 p.m. said, the pumps were running, too much water and couldn't keep up. Mark Medlar went back around Midnight-1:00 a.m. same thing, whole street was flooded, backed-up alot.	South Cove Rd	9/30/2002	DPW Director	Complete	
Possible sewer plug 12:16 pm.	50 South Cove Rd	10/29/2003	ROW - Streets	Complete	N/A
SR#6460 Possible sewer plug 3:25pm (customer originally called it in as South Prospect)	109 South Crest	8/21/2006	ROW - Streets	Complete	N/A
SR#6460 Possible sewer plug 9:00 am	109 South Crest	8/22/2006	ROW - Streets	Complete	N/A

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Check for sewer plug.	South Crest	2/11/2002	ROW - Streets	Complete	N/A
SR#7833 Possible sewer plug 9:32am	91 South Crest Dr	12/12/2007	ROW - Streets	Complete	Customer
RSN 9464 on 4/21/09 @ 7:45 a.m. Sewer plug in street, water backing up in house	91 South Crest Drive	4/21/2009	ROW - Streets	Complete	N/A
Sewer backing up into basement.	226 South Prospect St.	3/16/2001	ROW - Streets	Complete	Customer
possible sewer plug 10:20	915 South Prospect St	10/1/2004	ROW - Streets	Complete	
SR # 7913 possible sewer plug.	246 South Prospect St	1/9/2008	ROW - Streets	Complete	N/A
Possible sewer plug	530 South Union St	11/26/2002	ROW - Streets	Complete	N/A
SR#7295 Possible sewer plug 8:45am called into Dick	14 South Union St	6/7/2007	ROW - Streets	Complete	N/A

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
possible sewer plug, been plugged twice in the last 60 days..	508 South Union St	7/11/2007	ROW - Streets	Complete	
SR#9641 Possible sewer plug 1:00 pm	445 South Union St	6/1/2009	ROW - Streets	Complete	N/A
Possible sewer plug water and sewer is coming into the basement	25 - 27 South Willard St	8/13/2004	ROW - Streets	Complete	
just south of Maple St. sewer smell, called into Dicky as a possible sewer plug.	236 South Winooski Ave	1/4/2007	ROW - Streets	Complete	Customer
SR#7201 Possible sewer plug 3:00pm -	179 South Winooski Ave	5/8/2007	ROW - Streets	Complete	N/A
SR#8427 streets voicemail (8:33 am) Please check out the wet spot with the terrible sewer smell between Maple St & Adams St. another call 6/3/08 - same complaint - called into Brian - address is in front of 242 South Winooski. -co	South Winooski Ave	5/27/2008	ROW - Streets	Investigatio	Pending
SR#8569 possible sewer plug 1:10pm	406 South Winooski Ave	7/3/2008	ROW - Streets	Complete	N/A
SR # 9764 Possible sewer plug, manhole is overflowing in the alleyway. -Dicky is going up to check out the manhole. 2:20	36 South Winooski Ave	7/8/2009	ROW - Streets	Investigatio	

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#6627 Customer called and said that water was pouring in from his Sewer/drain. -12:39 pm	115 South Winooski Ave & College St	10/20/2006	ROW - Streets	Complete	N/A
SR 6048 check lines to make sure sewer lines are clear / clean Ned, told Danny to check these lines. Possible Sewer plug 2:23 p.m.	21 Southwind	5/19/2006	ROW - Streets	Complete	N/A
	29 Spring St	11/15/2004	ROW - Streets	Complete	N/A
SR#7556 Possible sewer plug (1:20pm) Called into Lorand	66 Spruce St	9/4/2007	ROW - Streets	Complete	N/A
SR#6825 Possible sewer plug - called in a 3:37 pm	59 St. Mary's St	1/9/2007	ROW - Streets	Complete	N/A
Possible sewer plug	383 St Paul St	4/26/2004	ROW - Streets	Complete	N/A
Possible sewer plug called into Dan 8/24/05 2:30	383 St Paul St	8/24/2005	ROW - Streets	Complete	
SR#8158 (521-531) Possible sewer plug - 9:59am (last night and today)	521 & 531 St. Paul St	4/1/2008	ROW - Streets	Complete	N/A

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#8402 Possible sewer plug @ 2:46 pm	St Paul St & Main St	5/20/2008	ROW - Streets	Complete	N/A
SR#7364 sewer plug 12:04pm from hard rain storm 7/9/07	169 Stanniford Rd	7/9/2007	ROW - Streets	Complete	N/A
RSN 9105 Sewer Plug - Travis from P&P talked to me and stated they augered 120 feet and says it is our line. Called Dick Hammon and they will send someone	40 Strong Street	12/12/2008	ROW - Streets	Complete	N/A
Houses on the whole side of the street has water back-ups when we got all of the water. He is concerned that the water seems like its not flowing when he looks down the storm drain. Please check sewer drains and storm drains to be sure water/sewer is draining fine.	192 Summit St	9/2/2004	ROW - Streets	Complete	N/A
Water is not draining out of sump pump hole, water lines to road have been checked. Please check sewer drains and storm drains to be sure water/sewer is draining fine.	140 Summit St	11/29/2004	ROW - Streets	Complete	
Backup in basement from sewer SR 8509 6/23/08 at 9:15 a.m	195 Summit St	6/23/2008	ROW - Streets	Complete	N/A
Possible sewer plug - 11:30	37 Tallwood Lane	6/25/2003	ROW - Streets	Complete	N/A
SR#5755 Possible sewer plug. Called into Billy P. 1:12 pm	65 Thibault Pkwy	2/7/2006	ROW - Streets	Complete	N/A

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#5755 Possible sewer plug. Customer called into answering service on 3/11/06- Mark responded. - Our line was plugged. Staff will go back on Monday to TV the Line. Line was full of roots- we cleaned them out per Dan	65 Thibault Pkwy	3/13/2006	ROW - Streets	Complete	Customer
Possible sewer plug.	140 Tracy Dr	12/24/2001	ROW - Streets	Complete	N/A
possible sewer plug. Customer said that he had water back-up in the basement last night, but now it seems to be gone. He wanted us to check our line to be sure its not plugged. 8:05 a.m.	University Terr	7/21/2004	ROW - Streets	Complete	
Possible sewer plug (8:00AM). Called again 1/30/04, same problem. -vb Plugged street drain 9/3/04 -lh water flooding basement 1/19/05 -co	49 University Terr.	5/21/2003	ROW - Streets	Complete	Customer
SR#7378 Catch basin is clogged from heavy rains - please clean them out so there will not be any sewer plugs. from hard rain storm 7/9/07 ~~~~~ Scott called again 7/20/07 said the storm drains needs to be cleaned out, they got flooded really bad at the Valade Park Condo's. At the top of Valade Park and on Sunset Dr.	Valade Park & Sunset Dr	7/10/2007	ROW - Streets	Complete	N/A
SR#7443 Possible sewer plug 9:20 am	107 Van patten Pkwy	7/24/2007	ROW - Streets	Complete	Customer
SR# 6932 Possible sewer plug 12:35pm- called into Dick	80 Vest Haven Dr	3/1/2007	ROW - Streets	Complete	Customer
SR#7008 Possible Sewer plug (10:37 am)	24 Vest Haven Dr	3/26/2007	ROW - Streets	Complete	N/A

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
Potential sewer plug.	15 Vine St.	2/6/2004	ROW - Streets	Complete	Customer
Possible sewer plug 10:21 am	93 Walnut St	12/21/2005	ROW - Streets	Complete	N/A
Possible sewer plug 11:30 a.m.	140 Wells St	7/21/2003	ROW - Streets	Complete	N/A
Possible sewer plug 8:10	140 Wells St	1/16/2004	ROW - Streets	Complete	N/A
possible sewer plug - 8:40	140 Wells St	4/22/2004	ROW - Streets	Complete	
possible sewer plug - 10:20 am	140 Wells St	8/19/2004	ROW - Streets	Complete	Customer
possible sewer plug - 10:37 am	95 Wells St	1/19/2007	ROW - Streets	Complete	Customer
SR#: 5370 Sewer backing up into basement. Called into Dan at 8:30 am.	140 Wells Street	10/3/2005	ROW - Streets	Complete	N/A

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#: 5419 sewer smell 11:00	140 Wells Street	10/17/2005	ROW - Streets	Complete	
Sewer plug.	28 West Rd	1/16/2001	ROW - Streets	Complete	Customer
Potentail sewer plug.	West Rd	2/19/2002	ROW - Streets	Complete	Customer
Possible sewer plug called in at 4:10 p.m.	34 West Rd	3/28/2003	ROW - Streets	Complete	N/A
Possible sewer plug 2:16 p.m.	81 West Rd	2/3/2004	ROW - Streets	Complete	N/A
possible sewer plug. called Dan 8:20	28 West Rd	10/28/2004	ROW - Streets	Complete	
Possible sewer plug called in at 8:20 was plugged with paper last time?	34 West Rd / manhole for sewer in front # 28	10/27/2004	ROW - Streets	Complete	
Possible sewer plug called in at 8:50 a.m. to Danny said that in front of 28 he popped the cover and its running slow. You should (what is usually done) go to the one past #34 and push that one out to North Ave. This happens about twice a year. he knows when his toilet overflows.	34 West Rd	5/24/2005	ROW - Streets	Complete	

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST**Monthly Activity**

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#7811 Possible sewer plug called in at 11:39 a.m. to Dick He said it is the cover out in front of 28 that we usually clean out	34 West Rd	11/28/2007	ROW - Streets	Complete	N/A
RSN 9155 Ms. Rockwood stated her downstairs toilet was bubbling which means the sewer in front of 28 West Road needs to be opened and sucked out.	28 West Road	12/29/2008	ROW - Streets	Complete	N/A
SR#6296 Possible sewer plug - 8:11am	66 Western Ave	7/10/2006	ROW - Streets	Complete	N/A
Norm came in and stated to call Dick Hammond and tell him about several sewer plugs on Western Avenue Western Avenue. Dick informed me that someone went out at ten o'clock on 2/11 and fixed the sewer plug but that two or three houses had water in the cellar. That the sewer plug was fixed.	Western Avenue	2/12/2009	ROW - Streets	Complete	N/A
SR# 7248 Possible sewer plug.... not sure when called in and to who. Happened before 8:00am	6 Wildwood Dr	5/23/2007	ROW - Streets	Complete	N/A
Possible sewer plug (9:15 am)	107 Woodbury Rd	10/25/2002	ROW - Streets	Complete	Customer
SR # 5711 possible sewer plug called into Dan 1:30	175 Woodbury Rd	1/19/2006	ROW - Streets	Complete	
SR#7702 Possible sewer plug 10:45 am	51 Woodbury Rd	10/25/2007	ROW - Streets	Complete	N/A

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR#7843 Possible sewer plug 1:15pm	188 Woodbury Rd	12/14/2007	ROW - Streets	Complete	N/A
Possible sewer plug. Customer has water coming into her basement. Contacted Dan Hill of the Street Dept at 9:00 am 2/25/03.	228 Woodlawn Rd	2/25/2003	ROW - Streets	Complete	Customer
Possible sewer plug - customer left message on Streets phone at 10:00 & 11:00 - sewer backing up in cellar.	Woodlawn Rd	6/16/2005	ROW - Streets	Complete	N/A
SR#6995 Possible sewer plug 9:25 am	102 Woodlawn Rd	3/20/2007	ROW - Streets	Complete	Customer
SR# 6792 Strong sewer smell. Customer checked all vents and drains. No blockages	173 Woodlawn Rd	6/18/2008	ROW - Streets	Complete	N/A
SR# 6792 -12:00 pm Strong sewer smell. Customer checked all vents and drains. No blockages	173 Woodlawn Rd	2/5/2009	ROW - Streets	Complete	N/A
RSN 9325 on 3/10/09 @ 1:40 p.m. Possible sewer plug	107 Woodlawn Road	3/10/2009	ROW - Streets	Complete	Customer
Possible sewer plug, 2 manholes and runs to pump station.	35 Wright Ave	1/5/2007	ROW - Streets	Complete	Customer

10/21/2009

CITY OF BURLINGTON - DEPARTMENT OF PUBLIC WORKS

SERVICE REQUEST

Monthly Activity

Description of Request	Location	Date R'c'v'd	Division	Status	Follow-up
SR # 8026 possible sewer plug	Wright Ave	2/26/2008	ROW - Streets	Complete	
Possible sewer plug called in to Dan @ 8:20am	5 York Dr	6/6/2005	ROW - Streets	Complete	N/A

Bryer, Dennis

To: ladams@ci.burlington.vt.us
Cc: ggreenwood@ci.burlington.vt.us, tgrover@ci.burlington.vt.us, sroy@ci.burlington.vt.us
Subject: Burlington Riverside Sewage Collection System Operation, Management and Emergency Response Plan

Dear Laurie,

As we discussed briefly during our phone conversation on March 8, 2010, I have reviewed the preliminary/draft Operation, Management and Emergency Response Plan for the Burlington Riverside Sewage Collection System that was forwarded to me on March 1, 2010, and have the following comments/thoughts:

1. It appears that a larger scale collection system map needs to be included as part of the document for improved clarity and so as to reflect the identification of all of the sewer manholes. That said, I want to note that the collection system map that was submitted is very comprehensive and well-presented none-the-less.
2. It is unclear what the notations '9UNK' on the collection map represent. The notation is used on both sanitary and storm sewer lines and needs to be clarified. My 'guess' is that it was used when the pipe size/material/age was not known.
3. The narrative portion of the document needs to be expanded to provide a generic response plan for dealing with sewerline blockages and structural failures. The previously submitted and approved Operation, Management and Emergency Response Plan for the wastewater treatment facilities, sewage pump stations, and stream crossings did include action plans for blockages due to grease accumulation (AP-VWW-104) and broken pipes within the collection system (AP-VWW-106), which could be referred to. These action plans would then need to be updated to address blockages due to root intrusion or solids/debris and the availability of equipment for jetting/rodding lines, cutting/treating roots, pneumatic plugs, etc.
4. The document indicates that there are four known 'trouble spots' within the collection system. However, it is unclear from the manhole numbers referenced exactly where the locations on East Avenue and Grover Street are on the collection system map. Perhaps the 'trouble spots' could be highlighted on the collection system map; although a larger scale map with all of the manhole numbers might provide clarification on this matter.

I hope these comments are helpful in finalizing the document and moving forward in preparing the Operation, Management and Emergency Response Plans for the Burlington Main and North Sewage Collection Systems. If there are any questions, please feel free to contact me.

Respectfully,

Dennis Bryer, P.E.
Environmental Engineer
Wastewater Management Division
802-241-3735, fax 802-241-2596

Note: Written communications to and from state officials regarding state business are considered public records and therefore may be subject to public scrutiny.

3/10/2010

Steve Goodkind, P.E.
Public Works Director

Laurie Adams
Assistant Director



P.O. Box 878
Burlington, VT 05402

(802) 863-4501 P
(802) 864-8233 F

February 26, 2010

Dennis Bryer, P.E. Environmental Engineer
State of VT ANR
Wastewater Management Division
103 South Main Street – The Sewing Building
Waterbury, VT 05671-0405

Re: Burlington Sewage Spill Prevention Plan (SSPP) for Riverside Collection System

Dear Mr. Bryer:

The City of Burlington Public Works Wastewater Division is submitting a draft SSPP for the Riverside Avenue Treatment Plant Collection system in advance of the July 2010 deadline so that we can receive your feedback on our approach. We are moving on to our North Collection system report and propose to use a similar format if that is reasonable to you. We appreciate your willingness to give us some preliminary review.

Sincerely,

A handwritten signature in cursive script, appearing to read "Laurie Adams".

Laurie Adams
Assistant Director DPW Water Quality

Cc: Gary Greenwood
Tim Grover
Steve Roy

1001-1002 c1. Burlington, VT, 05402



**State of Vermont
Department of Environmental Conservation**

Agency of Natural Resources

Wastewater Management Division
103 South Main Street – The Sewing Building
Waterbury VT 05671-0405
Phone: 802-241-3822
Fax: 802-241-2596
<http://www.anr.state.vt.us/dec/ww/wwmd.cfm>

August 20, 2009

Ms. Laurie Adams, Assistant Director
City of Burlington-DPW Water Quality
P.O. Box 878
Burlington, VT 05402

Subject: NPDES #VT0100153, Permit #3-1331, Burlington Main Wastewater Treatment Facility;
NPDES #VT0100226, Permit #3-1245, Burlington North Wastewater Treatment Facility;
NPDES #VT0100307, Permit #3-1247, Burlington East Wastewater Treatment Facility;
Approval of Operation, Management and Emergency Response Plan

Dear Laurie:

I have reviewed the final revisions to Operation, Management and Emergency Response Plan for the three Burlington Wastewater Treatment Facilities, the 25 sewage pump stations throughout the collection systems, and the three stream crossings within the collection systems that were received at this office on July 24, and August 18, 2009. The revised plan has been found to be acceptable, fulfilling the requirements of 10 VSA, Chapter 47, Section 1278, and the inspection schedules for the wastewater treatment facilities, sewage pump stations, and stream crossings are approved. This Operation, Management and Emergency Response Plan will by reference become part of the requirements of the Discharge Permits for the facilities when they are renewed and become effective.

At this time it is recommended that the City of Burlington implement this approved Operation, Management and Emergency Response Plan to prevent sewage overflows. It is recommended that records be kept to document that the inspection schedules are being followed. For the response plan, it is recommended that steps be taken to ensure that the equipment is available on short notice and that responses can be carried out in a timely manner to prevent/mitigate spills. When the renewed Discharge Permits become effective, these recommendations will become requirements.

A copy of the Operation, Management and Emergency Response Plan needs to be retained at each of the treatment facilities at all times for easy reference by the operators. The operators should review the document periodically so they remain familiar with the inspection schedules and response plans for those components deemed to be "prone to failure".

The operators need to periodically review and update the Operation, Management and Emergency Response Plan to account for any improvements and in response to any situations encountered. The Operation, Management and Emergency Response Plan will need to be updated in the future each



time the Discharge Permit is renewed, similar to the procedure currently being applied to Electric Power Failure Plans. If it is determined following a reassessment of the various components, inspection schedules, and response plans that the document does not need to be revised, then resubmission of the document should not be necessary.

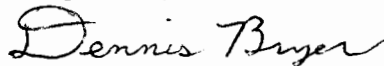
It is anticipated that the next renewal permit will include language that consolidates the Operation, Management and Emergency Response Plan and Electric Power Failure Plan into a single document. Also, it is envisioned that the new permit language will require that any updates to the plans need to be submitted for review and approval within 30 days following the effective date of the permit.

The review and approval of this Operation, Management and Emergency Response Plan by the Agency of Natural Resources shall not be construed as having relieved, modified, or in any manner affected the permittee's obligation to comply with all other federal, state, or local statutes and permits nor shall it relieve the permittee from civil or criminal penalties for any non-compliance.

It is requested that an electronic copy of the final Operation, Management and Emergency Response Plan and attachments, only if already available in electronic format, be voluntarily submitted to Ginny Little at ginny.little@state.vt.us. A pdf file is recommended, and we can also accept a document in Microsoft Word.

Please feel free to contact me if there are any questions or comments regarding this letter.

Respectfully,



Dennis Bryer, P.E.
Environmental Engineer

C: Brian Kooiker, Wastewater Management Division
Tim Grover, Burlington Main/North WWTFs Chief Operator
Gary Greenwood, Burlington East WWTF Chief Operator
Burlington Main Wastewater Treatment Facility Compliance File
Burlington North Wastewater Treatment Facility Compliance File
Burlington East Wastewater Treatment Facility Compliance File

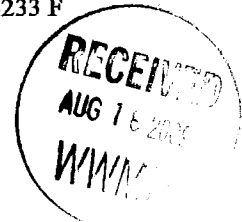
Steve Goodkind, P.E.
Public Works Director

Laurie Adams
Assistant Director



P.O. Box 878
Burlington, VT 05402

(802) 863-4501 P
(802) 864-8233 F



August 13, 2009

Dennis Bryer, PE Environmental Engineer
State of VT ANR
Wastewater Management Division
103 South Main Street – The Sewing Building
Waterbury, VT 05671-0405

Re: Update to Burlington Sewage Spill Prevention Plan

Dear Dennis:

Based on our conversation today I have updated section 5 regarding the Wastewater Lift Stations. The purpose was to clarify what types of anomalies triggers us to increase the frequency of station checking. I think we have accomplished this and I have updated my copy and will ask that Gary Greenwood and Tim Grover update their copies also.

I hope this is responsive to your request.

Sincerely,

A handwritten signature in cursive script, appearing to read "Laurie Adams".

Laurie Adams
Assistant Director DPW Water Quality

Cc: Gary Greenwood
Tim Grover

Bryer, Dennis

From: Laurie Adams [LAdams@ci.Burlington.vt.us]

Sent: Thursday, July 23, 2009 8:17 AM

To: Bryer, Dennis

Subject: Response to SSPP

Dennis

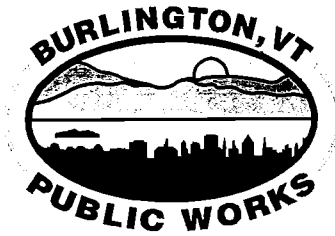
I just had my mailing that was sent 7/17 returned to me for another 44 cents postage. I added that and have put back in the mail today.

Laurie

7/23/2009

Steve Goodkind, P.E.
Public Works Director

Laurie Adams
Assistant Director



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July 17, 2009

Dennis Bryer, P.E., Environmental Engineer
State of VT ANR
Wastewater Management Division
103 South Main Street – The Sewing Building
Waterbury, VT 05671-0405



Re: Permit #s 3-1331, 3-1245 & 3-1247 O, M, and ERP

Dear Dennis:

For simplicity I will respond in the same numbered order as you:

- ✓ 1. The following language has been added to our introduction:

By utilizing the vulnerability assessment software package staff initially met and utilized this program to determine which components are prone to failure that would result in a release of untreated or partially treated sewage to waters of the state.

The City of Burlington utilized plan preparation guidance presented by VTDEC as the basis for our methodology in determining events that would result in a significant release of untreated or partially treated sewage to the surface waters of the state.

The level of risk follows the scale of 0-5.

0=Nil

1-2=Low

3-4=Moderate

5=High

The levels of probability follow the scale of 1-5.

1=Low

2-4=Moderate

5=High

When the risk times probability equals 5 this triggers addition to our List 2.

An Equal Opportunity Employer

For access to a TTY line (for persons with hearing impairments), call 802-863-0450

✓ 2. The effluent flow meter at Burlington East does not control the hypochlorite feed pumps for disinfection. At Burlington North the effluent flow meter does control the hypochlorite pumps for disinfection however the SCADA program is set for pump pacing to continue at minimum speed in the event of effluent flow meter failure.

✓ 3. See enclosed update.

7* 4. In our original submission we believe we were very conservative and grouped all the stations together as elements of concern. We have gone back and listed all of our stations and evaluated each independently. Based on the results of that analysis we believe our inspection schedule as originally presented is adequate given the results of our risk times probability summary.

See the enclosed matrix for a detailed description.

✓ 5. An updated map is enclosed showing correctly that Englesby crosses the sanitary and combined line once.

✓ 6. No response requested.

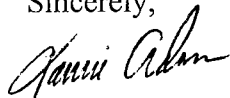
✓ 7. Staff will continue the twice/year dye testing but have deleted the annual internal inspection based on the inability to achieve useful results after using the camera in the field at this location.

✓ 8. The plan has been modified as follows:

Annually the Englesby Brook Stream Crossing will be externally inspected from the stream bank during low stream flow conditions. This inspection will substantiate whether the pipeline is exposed and/or undermined, therein in need of further attention.

Replacement pages for your copy of our plan are included with this letter. As always please call or email with questions.

Sincerely,



Laurie Adams

Assistant Director DPW Water Quality

Cc: Tim Grover
Gary Greenwood

Wastewater Management Division
103 South Main Street – The Sewing Building
Waterbury VT 05671-0405
Phone: 802-241-3822
Fax: 802-241-2596
<http://www.anr.state.vt.us/dec/ww/wwmd.cfm>

June 15, 2009

Ms. Laurie Adams, Assistant Director
City of Burlington - DPW Water Quality
P.O. Box 878
Burlington, VT 05402

Subject: NPDES #VT0100153, Permit #3-1331, Burlington Main Wastewater Treatment Facility;
NPDES #VT0100226, Permit #3-1245, Burlington North Wastewater Treatment Facility;
NPDES #VT0100307, Permit #3-1247, Burlington East Wastewater Treatment Facility
Operation, Management, and Emergency Response Plan

Dear Laurie:

I have reviewed the Operation, Management, and Emergency Response Plan that was submitted to this office on April 2, 2008, for the three Burlington Wastewater Treatment Facilities, the 25 sewage pump stations throughout the collection systems, and three stream crossings within the collection systems. The plans were well organized, detailed, and contained a lot of good information. However, my review of the document has resulted in the following comments that need to be addressed:

- ✓ 1. The Introduction needs to include a more detailed discussion of the methodology (Probability/Risk Matrix) applied to determine which components are 'prone to failure that would result in a release of untreated or partially treated sewage to waters of the state'.
- ✓ 2. Please clarify whether the effluent flow meters at the Burlington North and Burlington East Wastewater Treatment Facilities control the hypochlorite feed pumps for disinfection. If so, the effluent flow meters would be 'elements of concern', for which an inspection schedule and response plan would be necessary.
- ✓ 3. For completeness, the location map for the sewage pump stations needs to be revised to depict the Water Plant Pump Station.
4. The plan indicates that all of the sewage pump stations were deemed to be 'elements of concern' and that the stations will be inspected at least once per week, with a normal frequency of twice per week. The Division typically recommends sewage pump stations deemed to be 'elements of concern' be inspected daily, unless equipped with an auto-dialer or SCADA, wherein the inspection frequency may be reduced to three days per week. The inspection schedule needs to be revised accordingly or additional information included in the

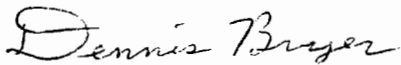


plan to substantiate how the proposed inspection schedule provides the same level of protection to prevent a spill to waters of the state.

5. The site map provided for the Englesby Brook Stream Crossing (inverted siphon) indicates that there are other locations where Englesby Brook crosses 'combined' sanitary/storm sewerlines. These 'combined' sewer stream crossings along with any others within the collection systems need to be included and evaluated as part of the Operation, Management, and Emergency Response Plan. The plan needs to be revised accordingly. ✓
6. The inspection schedule for stream crossings indicates that the length of the 'second' Winooski River stream crossing is much too far for camera equipment to view internally. In addition, since the crossing consists of a single barrel siphon, it is also not feasible to isolate and dewater the line to perform an internal inspection with closed-circuit television (CCTV) equipment.
7. The inspection schedule for stream crossings indicates that annually the Englesby Brook Stream Crossing will be internally inspected using the City's Envirosight Quickview Zoom Inspection Camera. Since this crossing also consists of a single barrel siphon, it would seem that it would not be feasible to isolate and dewater the line to perform an internal inspection. The plan may be revised accordingly.
8. In follow-up to item #7, the inspection schedule for the Englesby Brook Stream Crossing needs to be expanded to indicate that annually the stream crossing will be externally inspected from the streambank during low stream flow conditions. Such an inspection will substantiate whether the pipeline is exposed and/or undermined, therein in need of further attention. The plan needs to be revised accordingly.

Upon receipt of the revisions to the Operation, Management, and Emergency Response Plan discussed above, review of the document will be continued. It is requested that a revised plan be submitted to this office by July 17, 2009. If there are any questions with regard to this letter, please feel free to contact me.

Respectfully,



Dennis Bryer, P.E.
Environmental Engineer

C: Brian Kooiker, Wastewater Management Division
Tim Grover, Burlington Main/North WWTFs Chief Operator
Gary Greenwood, Burlington East WWTF Chief Operator
Burlington Main Wastewater Treatment Facility Compliance File
Burlington North Wastewater Treatment Facility Compliance File
Burlington East Wastewater Treatment Facility Compliance File

Steve Goodkind, P.E.
Public Works Director

Laurie Adams
Assistant Director



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March 31, 2008

Dennis Bryer, P.E. Environmental Engineer
State of VT ANR
Wastewater Management Division
103 South Main Street – The Sewing Building
Waterbury, VT 05671-0405



Re: Burlington Sewage Spill Prevention Plan (SSPP)

Dear Mr. Bryer:

The City of Burlington Public Works Wastewater Division is submitting a SSPP as required by Act 154. We have divided our plan into the three wastewater plants, pump stations for the entire collection system, stream crossings and our Electric Power Failure Plans and Emergency Response Plan. We hesitated to copy our ERP as we only have four printed copies due to the sensitive nature in this plan; however the information is pertinent to how we expect to minimize future sewage spills impacting waters of the state. We would appreciate that the state not reproduce the ERP of our plan if possible.

Sincerely,

Laurie Adams
Assistant Director DPW Water Quality

Cc: Gary Greenwood
Tim Grover
Steve Goodkind

Introduction:

The City of Burlington owns and operates three (3) separate wastewater collection and treatment systems. The overall collection system consists of approximately 49.7 miles of sanitary and combined sewers, 49.4 miles of sanitary only, 25 wastewater pumping stations and three advanced secondary wastewater treatment plants with a combined average daily capacity of 8.5 MGD. Treated flows are either discharged to the Winooski River (North and Riverside Plants) or to Lake Champlain (Main Plant). These discharges are authorized by the National pollutant Discharge Elimination System (NPDES) and are administered by the Agency of Natural Resources under Permits #3-1331, #3-1245 and #3-1247 for Main, North and Riverside systems respectively.

This Spill Prevention Plan has been written as required under Act 154, Section 5a) requires that municipalities assess their wastewater treatment facility components to determine which components are prone to failures that would cause a significant release of untreated or partially treated sewage to water of the State. The law further requires that the municipality set a schedule for the regular inspection of those components and prepare a plan to mitigate sewage spills resulting from a failure. This plan as such does not report on the collection system as this portion of the system is due July 1, 2010. However, aspects of the collection system are covered in our Emergency Response Plan.

Prior to the passage of Act 154 the city of Burlington Wastewater staff led by Laurie Adams, Assistant Director Water Quality, Tim Grover, Chief Operator Main & North Plants, and Gary Greenwood, Chief Operator Riverside Plant and pump stations met starting in May 2006 to develop a Vulnerability Assessment. Tim Grover attended WEF training in September 2006 that included one day of Vulnerability Assessment Training and two days of Emergency Response Training. Our Vulnerability Assessment followed EPA guidance and reports responsibly the results of a thorough analysis of threats, existing countermeasures, vulnerabilities, assets at risk, and new countermeasures needed to reduce risks. The VA was complete in March 2007. From the VA we developed an Emergency Response Plan (July 2007) that included individual action plans for various identified scenarios considered the most critical risks. A full copy of our Emergency Response Plan is included with this Sewage Spill Prevention Plan submission. Finally, included are copies of previously submitted Electric Power Failure Plans for all three systems as relevant information is contained in these plans.

By utilizing the vulnerability assessment software package staff initially met and utilized this program to determine which components are prone to failure that would result in a release of untreated or partially treated sewage to waters of the state.

The City of Burlington utilized plan preparation guidance presented by VTDEC as the basis for our methodology in determining events that would result in a significant release of untreated or partially treated sewage to the surface waters of the state.

The level of risk follows the scale of 0-5.

0=Nil

1-2=Low

3-4=Moderate

5=High

The levels of probability follow the scale of 1-5.

1=Low

2-4=Moderate

5=High

When the risk times probability equals 5 this triggers addition to our List 2.

Main Plant List 2 Elements

From the table one checklist, we have determined that these components in the Main Plant wastewater facility have a moderate probability of failure that would result in a partial or significant release of untreated sewage to waters of the state. These components scored higher than 5 on the Risk Probability (RP) matrix.

- CSO (wet weather) Disinfection System
- Effluent (dry weather) Disinfection System

There are other potential components that would result in a moderate release of untreated sewage such as Influent pump failure, however due to the redundancy and past history, the RP value was below the threshold for further follow up. Main Plant has an autodialer system that currently covers 36 different alarms. The dialer sends out the alarm to Homes Security, which in turn follows a phone protocol to contact someone to respond to any of these 36 alarms. There is always an on call operator, who carries a pager, and has access to the SCADA computer from their home. These controls prevent or often minimize any failures that would cause a sewage spill.

The disinfection systems for both the dry and wet weather deserves further explanation due to a higher probability and risk of occurring.

CSO Wet Weather disinfection system

During any rain event where the CSO vortex operates, the disinfection system is activated. This system requires both Sodium hypochlorite and Bromine pumps. These pumps are triggered by the SCADA system when the first CSO pump is activated. A recent event revealed that when the SCADA computer was locked up, the trigger was not activated. This problem has been corrected by a watchdog timer on the computer itself, as well as transferring the logic to the SCADA PLC, which is more reliable. The disinfection pumps themselves also have alarms which will page the on call operator. A Pre and Post Rain Event SOP was written which includes a CSO rounds checklist. In addition to these inspections, a daily rounds sheet includes inspecting the wet weather disinfection pumps by bumping them to ensure they are ready for operation.

Effluent Wet Weather disinfection system

Main Plant's discharge Permit requires public notification when chlorine addition is terminated or the dry and or wet weather discharges e-coli exceeds 6160 col/100mls. Many improvements have been made in recent years to make this system even more failsafe. There are 3 new peristaltic pumps which have replaced the problematic LMI

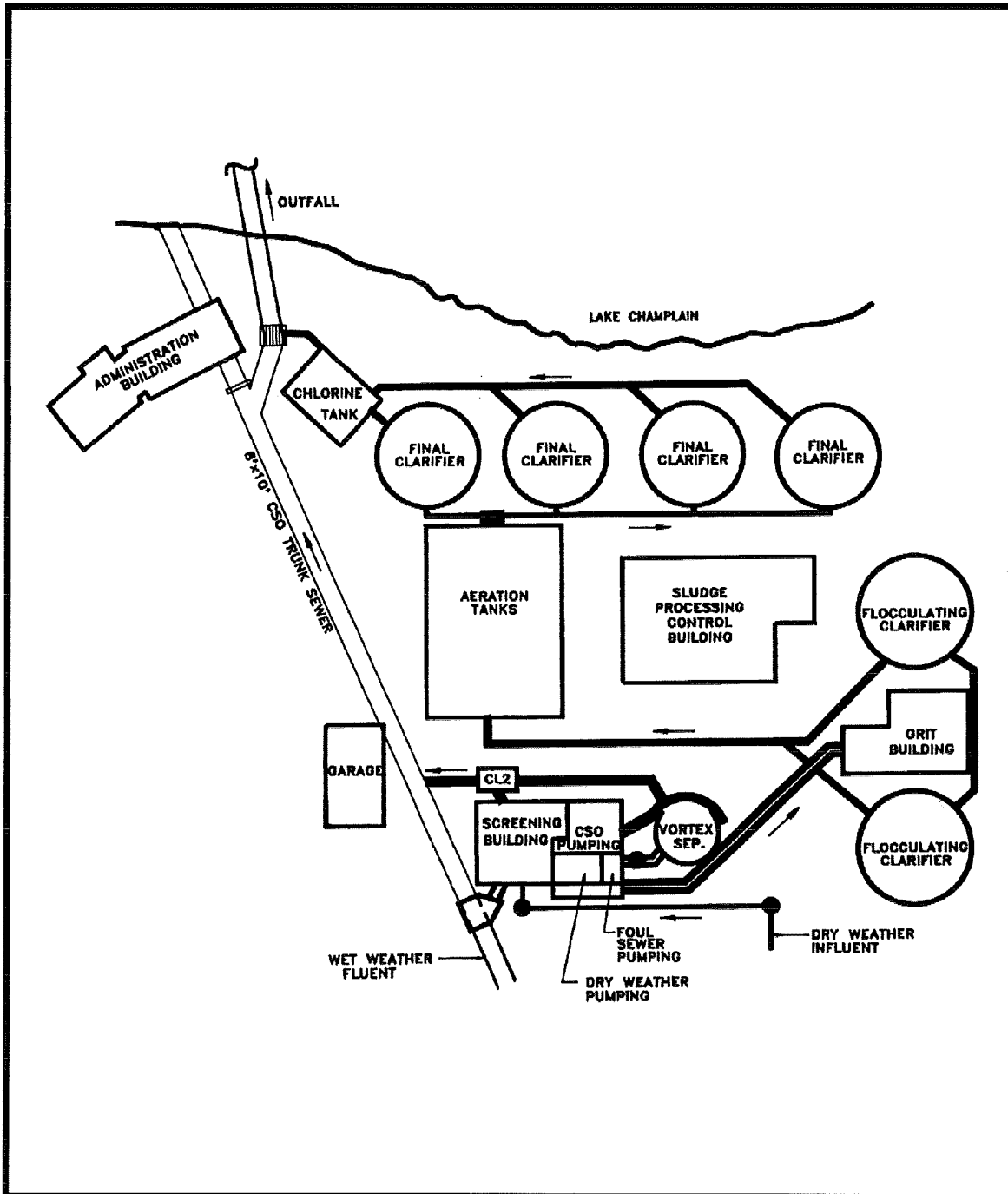
pumps. These pumps are all alarmed and also alarmed for any leaks from hose failure. An SOP was written to ensure the hoses are checked daily for leaks and advanced on a routine basis. The chlorine analyzer has been replaced recently. This ensures proper dosing and is alarmed for low or high chlorine residuals. An SOP explaining what to do in case there is an alarm on the analyzer ensures the operator follows steps to troubleshoot and minimize any problem. A temporary disinfection system was also

installed at the chlorine contact tank. A rotameter and dosage chart is part of the temporary tank to ensure a proper dosage until the problem can be corrected. Daily rounds include checking all the tanks, valves, pumps and pump controls associated with the disinfection system. In all, there are 6 alarms associated with the disinfection system. An operator is always on call at Main Plant and is paged for any of these alarms.

In the case of an effluent flow meter failure, the chlorine system would still trim and attempt to target the desired residual. In the event the trim could not keep up, a low TRO alarm would be sent out to the on call operator. The operator has the ability to dial in remotely and troubleshoot from home. In this case, he would be able to switch to manual mode until the flow meter problem was corrected.

Main Plant Checklist	Risk	Probability	R-P Value	Controls in Place	Comments
Headworks					
Influent Flow Metering System	1	1	1		Failure would not result in spill
Mechanical Bar Rack	1	1	1	Zone 10 alarm, bypass channel	Failure would not result in spill
Influent Pumps	2	2	4	Zone 4&6 alarms, b-up pumps	Pump failure, high wet well
Pumping Controls	2	2	4	Zone 6&11alarms	high wet well, SCADA alarm
Yard Piping	2	1	2	Visual daily rounds	Break in Pipe could result in spill
Grit Removal System	1	2	2	Visual daily rounds	Failure would not result in spill
CSO Treatment					
Pumping Controls	2	2	4	Zone 34,35 & 11alarms	Wet well & SCADA alarms
CSO Bar Screen	1	1	1	Zone 9 alarm	Failure would not result in spill
CSO Pumps	2	1	2	Zone 3,34&35 alarms,b-up pumps	Pump failure,wet well alarms
Disinfection Pumps	3	2	6	Zone 38,41&11alarms,b-up pumps	Wet weather pumps& SCADA alarms
Foul Sewer Pumps	2	2	4	Zone 7&8 alarms, 2 pumps	Wet well & pump failure alarms
Primary Clarifiers					
Tankage,Mechanical	1	1	1	Zone 26&Visual daily rounds	Overtorque alarm
Splitter Boxes	1	1	1	Visual daily rounds	
WAS Pumping	1	1	1	Visual daily rounds, 2 pumps	
Yard Piping	1	1	1	Visual daily rounds	
Biological Treatment					
Aeration Tanks	2	1	2	Annual inspections, daily visual	
Splitter Boxes/Control Valves	2	2	4	Chains & locks on gates,valves	
Blowers, Controls	2	2	4	Zone 5 Alarm,extra blowers	Blower failure alarm
Yard Piping	1	1	1	Visual daily rounds	
Secondary Clarifiers					
Tankage, Mechanical	2	2	4	Zone 25 & 12-15 alarms	Overtorque & DOB alarms
Splitter Boxes	2	2	4	Visual daily rounds	
RAS/WAS Pumping	2	2	4	Zone 2&28, b-up pumps	RAS pumps fail & Sump pump alarms
Yard Piping	1	1	1	Visual daily rounds	
Disinfection					Switched to peristaltic Pumps 2006
Chlorine Contact Tank	1	1	1	Visual daily rounds	
Disinfection Pumps	3	2	6	Zone 37&30,b-up pumps	Pump failure & leak detect Alarms
HypoTank/Valves	3	1	3	Zone 16,27&33 alarms	Low level & sump pump alarms
Disinfection controls	2	3	6	Cl2 analyzer w/ zone 42 alarm	New Cl2 unit 2006 hi/low TRO alarm
Yard Piping	1	1	1	Visual daily rounds	

Main Plant Checklist	Risk	Probability	R-P Value	Controls in Place	Comments
Effluent flow metering	1	2	2	Back up Influent meter	Cl2 Trim (pump7) would still function
Sludge Handling					
Dewatering Equipment	1	1	1	All drains go to Headworks	Failure would not result in spill
Sludge Pumping Systems	2	1	2	Zone 29 alarm	Solids transfer sump pump alarm
Yard Piping	1	1	1	Visual daily rounds	
Emergency Power Generator	2	1	2	AC failure & Zone 24 alarm	Generator operation prevents partial



BURLINGTON
PUBLIC WORKS
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Burlington, VT 05401

MAIN WWTP PLANT LAYOUT & GENERAL FLOW PATTERN

SCALE: None

DATE
5/14/07

FIG.
A

Burlington Riverside Avenue

We have determined that the only component in the Riverside Avenue treatment plant that has a moderate probability of failure resulting in a partial or significant release of untreated sewage to the waters of the state is the disinfection system. Riverside Avenue can be completely run by generator in the event of a power failure (see enclosed Electric Power Failure Plan).

The Riverside Avenue plant disinfection system has an LMI pump, with a spare LMI pump and two(2) Wallace & Tiernan pumps for backup. Daily rounds include inspection of the pumps, tank and all lines and valves. A daily chlorine residual is run and dosages are adjusted accordingly. There is an AC failure alarm which would dial an on-call operator in case of failure after working hours.

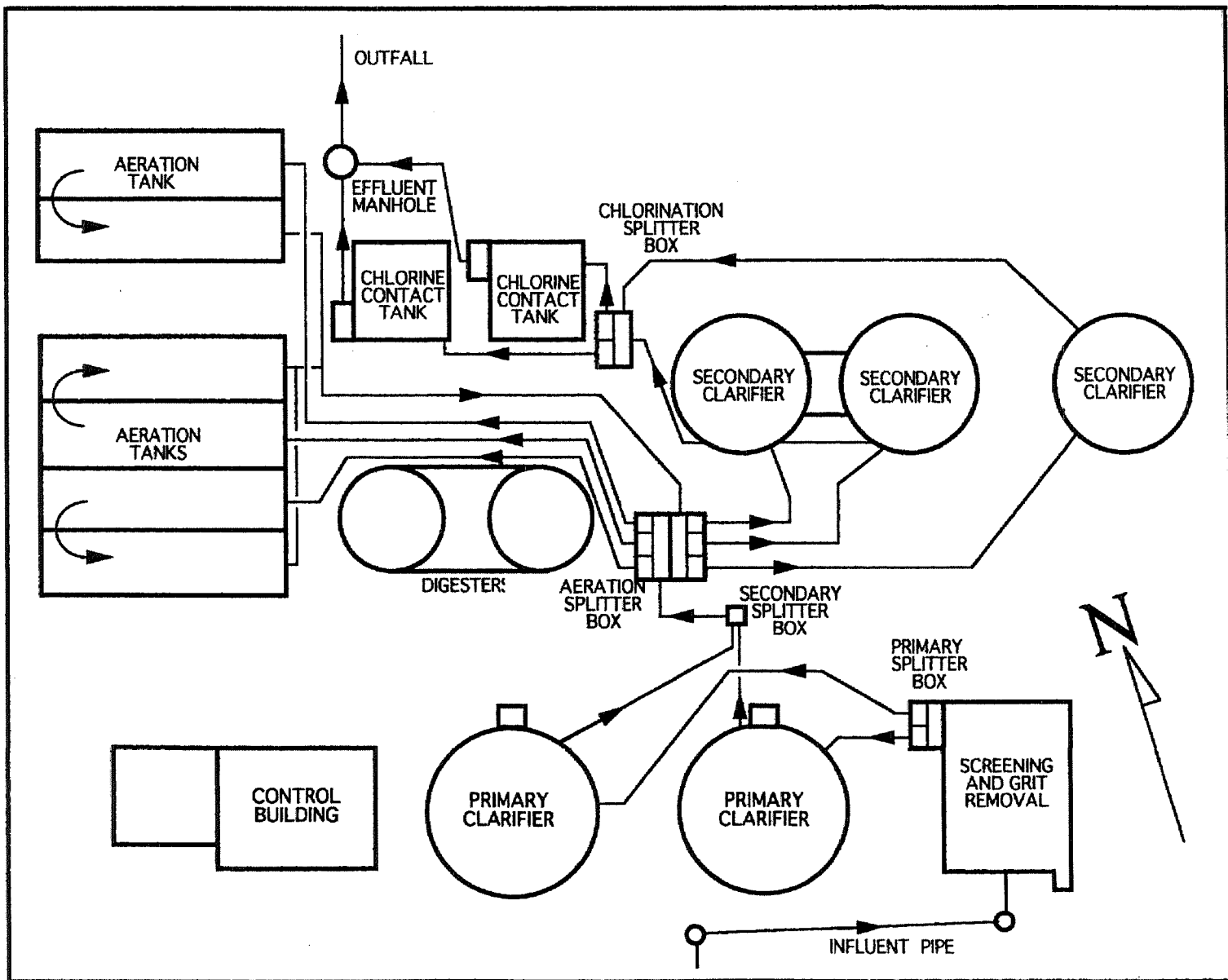
slow meter control
C12 pump?

East Plant Checklist	Risk	Probability	R-P Value	Controls in Place	Comments
Headworks					
Mechanical Bar Rack	1	1	1	Visual daily rounds, routine maint.	Failure would not result in spill
Yard Piping	3	1	3	Visual daily rounds	Break in Pipe could result in spill
Septage Receiving	2	1	2	Visual daily rounds	Break in Pipe could result in spill
Grit Removal System	1	1	1	Visual daily rounds, routine maint.	Failure would not result in spill
Primary Clarifiers					
Tankage, Mechanical	1	1	1	Visual daily rounds, routine maint.	Failure would not result in spill
Splitter Boxes	1	1	1	Visual daily rounds, routine maint.	
Yard Piping	3	1	3	Visual daily rounds	Break in Pipe could result in spill
Biological Treatment					
Aeration Tanks	3	1	3	Visual daily rounds, routine maint.	
Splitter Boxes/Control Valves	1	1	1	Visual daily rounds, routine maint.	
Blowers, Controls	1	1	1	Visual daily rounds, routine maint.	Failure would not result in spill
Yard Piping	3	1	3	Visual daily rounds	Break in Pipe could result in spill
Secondary Clarifiers					
Tankage, Mechanical	2	1	2	Visual daily rounds, routine maint.	Failure would not result in spill
Splitter Boxes	1	1	1	Visual daily rounds, routine maint.	
RAS/WAS Pumping	1	1	1	Visual daily rounds, routine maint.	Failure would not result in spill
Yard Piping	3	1	3	Visual daily rounds	Break in Pipe could result in spill
Disinfection					
Chlorine Contact Tank	1	1	1	Visual daily rounds	
Splitter Boxes	1	1	2	Visual daily rounds, routine maint.	
Effluent Flow Meter	1	1	1		Failure would not result in spill
Disinfection Pumps	4	2	8	Visual daily rounds, routine maint.	Pump failure alarm, backup pump(s)
HypoTank/Valves	2	1	2	Visual daily rounds, routine maint.	
Disinfection controls	4	2	8	Visual daily rounds, routine maint.	
Yard Piping	1	1	1	Visual daily rounds	Break in Pipe could result in spill
Sludge Handling					
Anearobic Digesters(2)	3	1	2	Visual daily rounds, routine maint.	
Sludge Pumping Systems	1	1	1	Visual daily rounds, routine maint.	Failure would not result in spill
Gas Mixing System	1	1	1	Visual daily rounds, routine maint.	Failure would not result in spill
Methane Collection System	1	1	1	Visual daily rounds, routine maint.	Failure would not result in spill
Yard Piping	3	1	3	Visual daily rounds	Break in Pipe could result in spill
Emergency Power Generator	1	1	1	Visual daily rounds, routine maint.	Generator operates entire plant in event
					of a power failure

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EAST WWTP
PLANT LAYOUT &
GENERAL FLOW PATTERN

SCALE: NONE	FIG. A
DATE: 9-8-94	



North Plant List 2 Elements

From the table one checklist, we have determined that the only component in the North Plant that has a moderate probability of failure resulting in a partial or significant release of untreated sewage to waters of the state is the disinfection system. This component scored higher than 5 on the Risk Probability (RP) matrix.

There are other potential components that would result in a moderate release of untreated sewage such as intermediate wet well flooding or pump failure, however due to the redundancy, extra tank storage and past history, the RP value was below the threshold for further follow up. North Plant has an autodialer system that currently covers 11 different alarms. The dialer sends out the alarm to Homes Security, which in turn follows a phone protocol to contact someone to respond to any of these 11 alarms. There is always an on call operator. These controls prevent or often minimize any failures that would cause a sewage spill.

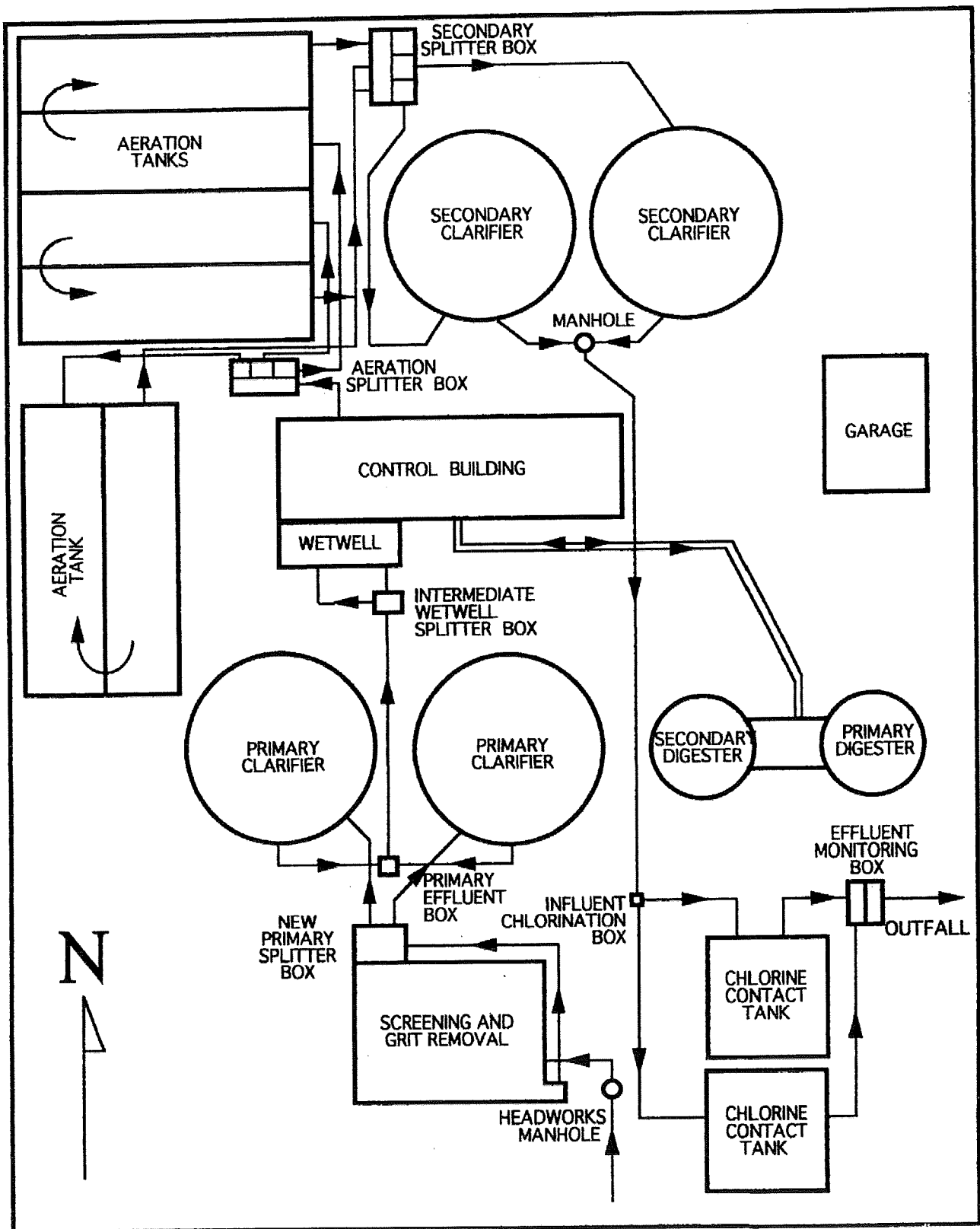
Effluent disinfection system

North Plant has 1 peristaltic pump and two back up LMI pumps. There are two alarms associated with the pump, ac failure and pump failure. Either of these will dial out an on call operator. Daily rounds include inspection of the pumps, tanks and valves. A daily chlorine residual is run and dosages are adjusted accordingly.

effluent flow
meter control
to pump?

North Plant Checklist	Risk	Probability	R-P Value	Controls in Place	Comments
Headworks					
Mechanical Bar Rack	2	2	4	Zone 6 alarm, bypass channel	
Yard Piping	2	1	2	Visual daily rounds	
Grit Removal System	1	1	1	Visual daily rounds	Failure would not result in spill
Primary Clarifiers					
Tankage, Mechanical	2	1	2	Zone 3 alarm	Overtorque alarm
Splitter Boxes	1	1	1	Visual daily rounds	
Yard Piping	1	1	1	Visual daily rounds	
Intermediate Wet Well					
Wet well Controls	2	2	4	Transducer & float back up	Off line aer. tanks valved for extra storage
Wet well Pumps	2	2	4	Zone 1&2 Alarms, 3 Pumps	Wet well & basement sump pump alarms
Biological Treatment					
Aeration Tanks	2	1	2	Annual inspections, daily visual	
Splitter Boxes/Control Valves	2	1	2	Visual daily rounds	
Blowers, Controls	2	2	4	Zone 4 alarm, extra blowers	Blower failure alarm
Yard Piping	1	1	1	Visual daily rounds	
Secondary Clarifiers					
Tankage, Mechanical	2	2	4	Zone 9 alarm	Overtorque
Splitter Boxes	2	2	4	Visual daily rounds	
RAS/WAS Pumping	2	2	4	Zone 7&1 alarms, b-up pumps	RAS pumps fail & Sump pump alarms
Yard Piping	1	1	1	Visual daily rounds	
Disinfection					Switched to peristaltic Pumps 2006
Chlorine Contact Tanks	1	1	1	Visual daily rounds	
Disinfection Pumps	3	2	6	Zone 8&10, b-up pump, visual	Pump fail & AC Alarms
HypoTank/Valves	2	1	2	Visual daily rounds	
Yard Piping	1	1	1	Visual daily rounds	
Effluent flow metering	1	1	1	Visual daily rounds	pump pacing will continue at min. speed

North Plant Checklist	Risk	Probability	R-P Value	Controls in Place	Comments
Sludge Handling					
Anaerobic Digesters	2	2	4	Overflows to headworks	Nearby catch basin drains to headworks
Sludge Pumping Systems	2	1	2	Visual daily rounds	
Yard Piping	1	1	1	Visual daily rounds	
Leachate holding Tank	2	1	2	Driver observes offloading	double wall tank and leak detection alarm
Septage receiving	2	2	4	Driver observes offloading	Piped directly to bypass channel in HW
Emergency Power Generator	2	1	2	AC failure alarm	Generator operation prevents partial
					treatment or no disinfection of sewage



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**NORTH WWTP
PLANT LAYOUT &
GENERAL FLOW PATTERN**

SCALE: NONE

DATE:
9-8-94

FIG.
A



Burlington Wastewater Lift Stations

Burlington owns and operates twenty-five (25) wastewater lift stations around the city. There are four (4) stations associated with the Riverside Avenue Facility, seven (7) stations associated with the North Avenue Facility and fourteen (14) stations associated with the Main Treatment Facility. The following chart shows Burlington's lift stations by Treatment Plant and their age. Wherever two dates are listed, the first is the date built and the second is the most recent rehab.

Main Plant	East Plant	North Plant
Lower North Beach 1963, 1996	Fletcher Place 1972, 2002	Van Patten 1982
Upper North Beach 1963, 2006	Chase Street 1979	Brook Drive 1986
High School 1963, 2007	Mill Street 1975, 1994	Lori Lane 1986
College Street 1962, 2005	McNeil Station 1983	Apple Tree Point 1987
Perkins Pier 1985		Crescent Beach 1966
Proctor Place 1962, 2007		Leddy Park 1973
Lakeside St. 1983, 2006		Birch Court 1989
Flynn Avenue 1978		
South Cove 1966, 1997		
Queen City 1986, 1991		
Pine Street 1972, 2008		
Intervale Landfill 1986		
Lake Street 2004		
Water Plant 1982, 2008		

All of Burlington's lift stations have a two (2) pump system with a lead/lag alternation control system. Should one pump fail, the second pump would respond at a slightly higher wet well liquid level. All of our lift stations are also equipped with alarm systems. All have visual and audible alerts at the station, and all stations in close proximity to the lake are also equipped with phone dialers to alert on-call operators of a problem. None of Burlington's lift stations have any sort of overflow structure. Any stations that were built with overflow structures have long since been plugged, sealed or removed. Any overflow occurring at a Burlington lift station would have to occur through manhole covers, etc.

All Burlington lift stations are visited and inspected **AT LEAST** once per week. The normal inspection frequency for all stations is twice per week. If we are experiencing anything unusual or abnormal with any stations, they are checked as often

as needed, whether this is once per day or once every several hours, until we have affected repairs to the station and are satisfied that the station is running properly. Events that trigger action include any alarm that can not be corrected or immediately understood, a phone call from a concerned citizen reporting an alarm, one pump out of service, and controller problems. Any of these types of situations will lead the pump station crew to check the station daily or more often until the problem is resolved.

All wastewater lift stations have the potential for the discharge of untreated sewage which, depending on location, could find its way to the waters of the state. The most common or frequent problem for Burlington is power outages, and an extended city wide power outage is probably the only condition in which this discharge would occur. Burlington's Emergency Response Plan contains Action Plans to cover such emergencies. In addition, in our Electric Power Failure Plans storage for all stations was evaluated and a capital pump station improvement plan was developed (10/5/05) and accepted by the State. DPW has kept to this plan and intends to follow through on all improvements listed through 2010. Extended power outages would require tanking from the affected station(s) to keep wet wells from overflowing. Burlington owns and operates two (2) four thousand (4,000) gallon tanker trucks which would be utilized in this situation. If needed, Burlington could also hire tankers from companies such as The Hartigan Company. Mutual Aid agreements and Action Plans are covered in detail in Burlington's Emergency Response Plan.



Pump Stations	Risk	Probability	R-P Value	Controls in Place	Comments
Lower North Beach	3	1	3	Light, bell, dialer	
Upper North Beach	3	1	3	Light, bell, dialer	
High School	3	1	3	Light, bell, dialer	
College Street	3	1	3	Light, bell, dialer	
Perkins Pier	3	1	3	Light, bell, dialer	
Proctor Place	3	1	3	Light, bell, dialer, generator	
Lakeside Avenue	1	2	2	Light, bell	Station serves two houses, ample storage.
Flynn Avenue	3	1	3	Light, bell, dialer	
South Cove	3	1	3	Light, bell, dialer	
Queen City	2	1	2	Light, bell, dialer	
Pine Street	1	2	2	Light, bell	Complete station rehab in 2008
Intervale Landfill	N/A	N/A	N/A	Light	Pumps leachate only
Lake Street	3	1	1	Light, bell, dialer	
Water Plant	3	1	3	Light, bell, alarm w/staff 24/7	Water Plant control room receives alarm from pump station
Fletcher Place	2	2	4	Light, bell	
Chase Street	2	2	4	Light, bell	
Mill Street	3	1	3	Light, bell, dialer	
McNeil Station	1	2	2	Light, bell	
Van Patten	1	2	2	Light, bell	
Brook Drive	1	2	2	Light, bell	
Lori Lane	1	2	2	Light, bell	
Apple Tree Point	3	1	3	Light, bell, dialer	
Crescent Beach	3	1	3	Light, bell, dialer	
Leddy Park	2	1	2	Light, bell, rings in building	Station only serves Park Dept. building. Staff there when in use.
Birch Court	1	2	2	Light, bell	

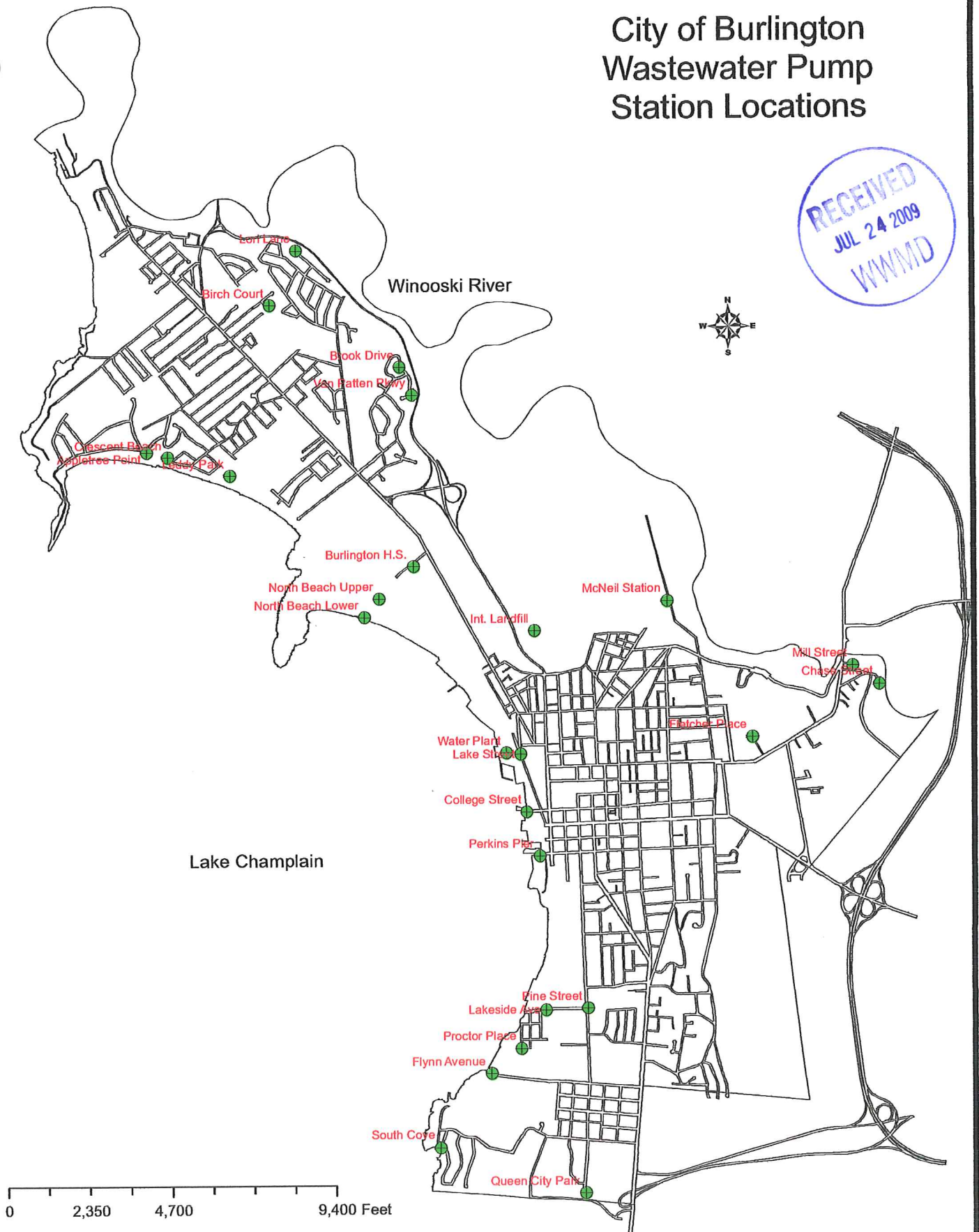
On the probability ranking for stations a level 1 was chosen when likely we could have chosen 0. With controls of a light, bell and auto dialer with battery backup, notice should always be quick when these stations go into alarm.

All the stations that were near a water body were given a 3 for Risk but a low probability given all the controls, including storage in place.



Pump Station Checklist	Risk	Probability	R-P Value	Controls in Place	Comments
Sewage Pumps	3	2	6	Locked, power outage biggest conc	
Pump Control System	3	2	6	Locked, power outage biggest conc	
Alarm/Auto Dialer System	1	1	1	Battery Backup	
Wet Well Compartment	3	1	3	Underground	
Dry Well Compartment	1	1	1	Locked	
Pump Intake/Discharge Piping	2	1	2	Locked	
Valve Pit	2	1	2	Locked	
Pump Isolation/Check Valves	2	1	2	Locked	
Sewer Force Main Piping	3	1.5	4.5	Underground, some aging	
Emergency Storage Tank	1	1	1	Underground tanks	
Emergency Power Generator	1	1	1	Locked	

City of Burlington Wastewater Pump Station Locations



0 2,350 4,700 9,400 Feet

Stream Crossings:

There are three single barrel siphon sewer line stream crossings in the collection system. Two of the crossings are part of the North Plant collection system at the Winooski River and the third is in the Main Plant collection system across Englesby Brook.

The first siphon crossing the Winooski River was most recently replaced in 2006 with 30" SDR11, HDPE pipe approximately 20 feet beneath the river bed. There are no joints in this pipe, and given the depth under the river, was determined to have a low (0) probability for being prone to failure with a high (5) risk for a significant release of untreated sewage to waters of the State.

The second Winooski River crossing was installed in 1955, of 24" cast iron pipe. This is rated as having a moderate (3) probability for being prone to failure with a high risk (5) for a significant release of untreated or partially treated sewage to waters of the State. An inspection schedule and a response plan are needed for this crossing. A sewage spill at this second crossing is more likely to be the result of debris and undermining of the pipe in periods of high flow.

The third pipe is a 15" vitrified clay and 10" asbestos cement siphon installed in 1911 at Foster Street at Flynn Avenue crossing Englesby Brook. This is rated as having a moderate (3) probability for being prone to failure with a high risk (5) for a significant release of untreated or partially treated sewage to waters of the State. An inspection schedule and a response plan are needed for this crossing.

Inspection Schedule

The second Winooski River pipe crossing is on an annual schedule to be checked by a professional diver. The section that is not buried in the river bottom needs to be monitored for changes in the river bottom and whether any debris has become lodged next to the pipe. In addition this pipe will be dye tested in the spring and fall each year. The length of this pipe across the river is much too far for camera equipment to view internally.

Annually the Englesby Brook Stream Crossing will be externally inspected from the streambank during low stream flow conditions. This inspection will substantiate whether the pipeline is exposed and/or undermined, therein in need of further attention.

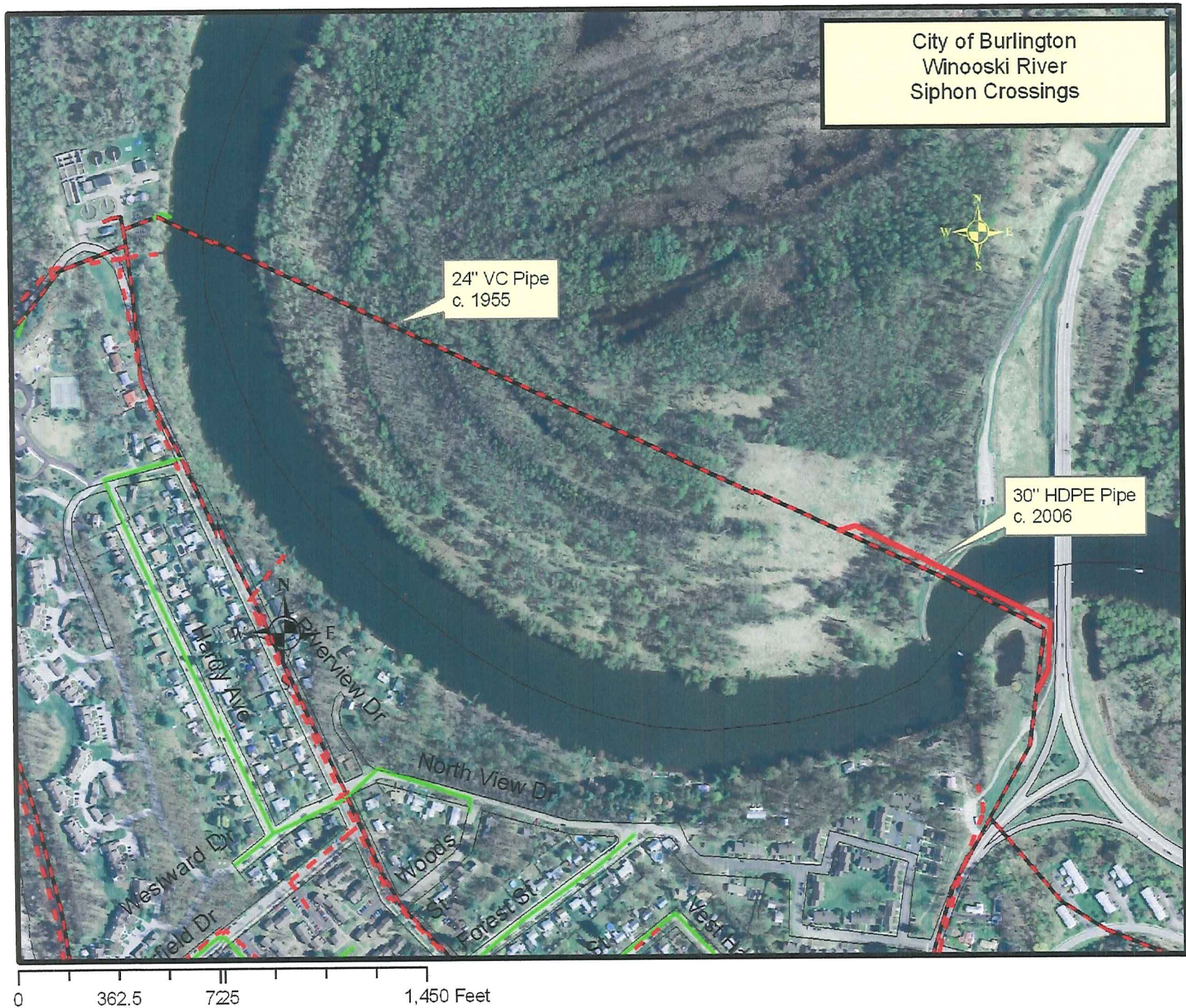
The siphon crossing Englesby Brook will be dye tested in the spring and fall each year. We will also set up the optical brightener test pads similar to our outfall testing. Most detergents used in clothes washing contain optical brighteners that absorb onto an unbleached cotton pad. The advantage of this test is that the pad is continuously sampling flow for the period of time it is in service and even small concentrations of OB can be detected. An example of recent tests are documented in this section on the overview map.

Response Plan

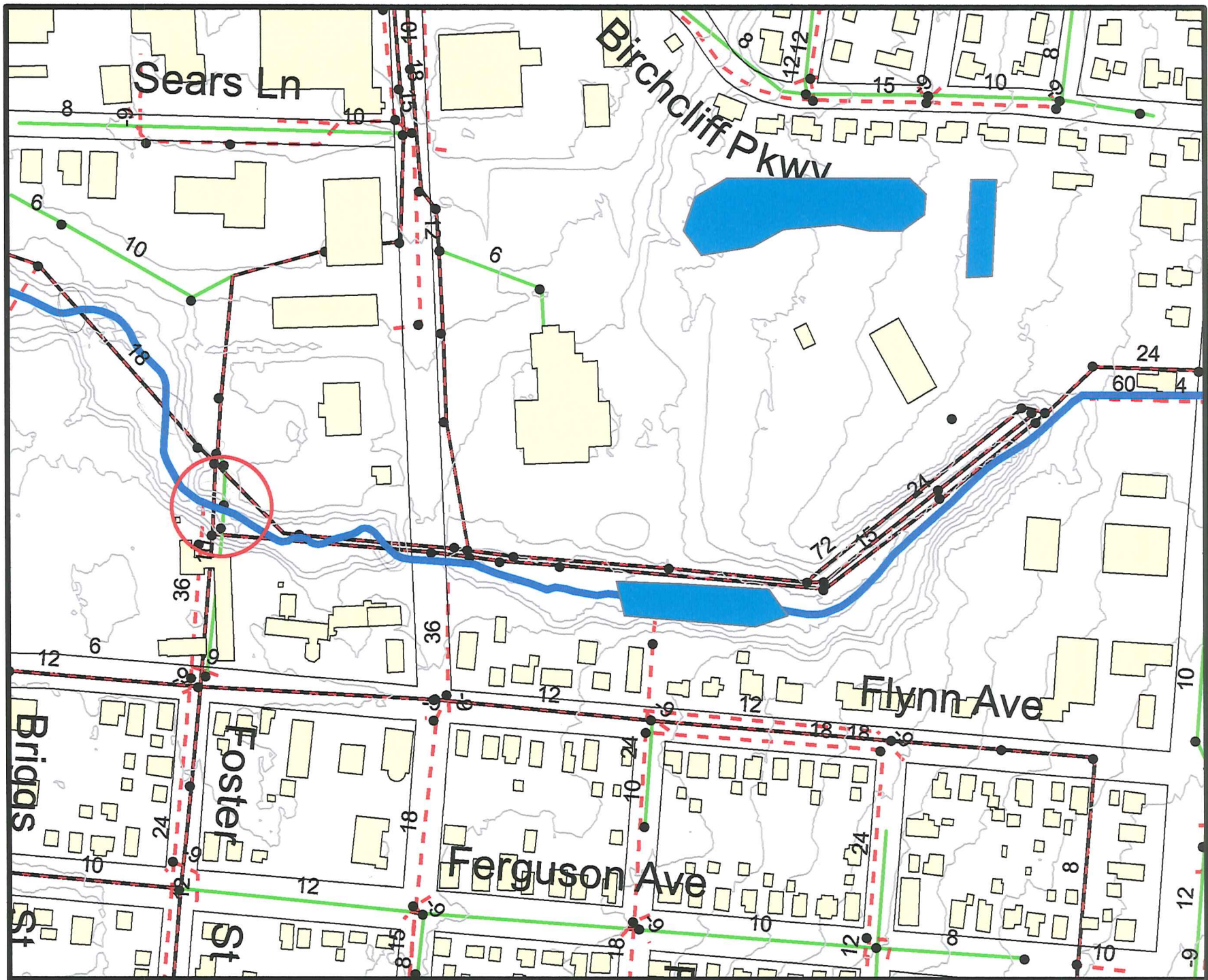
In the event of a sewage spill at a stream crossing please see page 51 of our Emergency Response Plan, Action Plan 107. A sewage spill due to an in-line blockage is unlikely at all the crossings given the influence of stormwater in the combined systems leading to significant rain induced flushing.

All crossings are single barrel, inverted siphon pipe configurations.

River/Stream Crossings	Risk	Probability	R-P Value	Controls in Place	Comments
Winooski River - 1st crossing					
Siphon-2006, 30" SDR11,HDPE pipe	5	0	0	There are no joints in this pipe	Failure would result in spill
				and it is bored approximately 20'	
				beneath the river bottom.	
				Spring/Fall Dye testing	
Winooski River - 2nd crossing					
Siphon-1955, 24" Cast Iron pipe	5	3	15	Annual check by professional diver	Failure would result in spill
				Spring/Fall Dye testing	
Englesby Brook					
Foster St. at Flynn Ave.	5	3	15	Spring/Fall Dye testing &	Failure would result in spill
Siphon-1911, 15" VC and 10" AC				Optical brightener testing.	Condition viewed in part with Quick View
					Camera



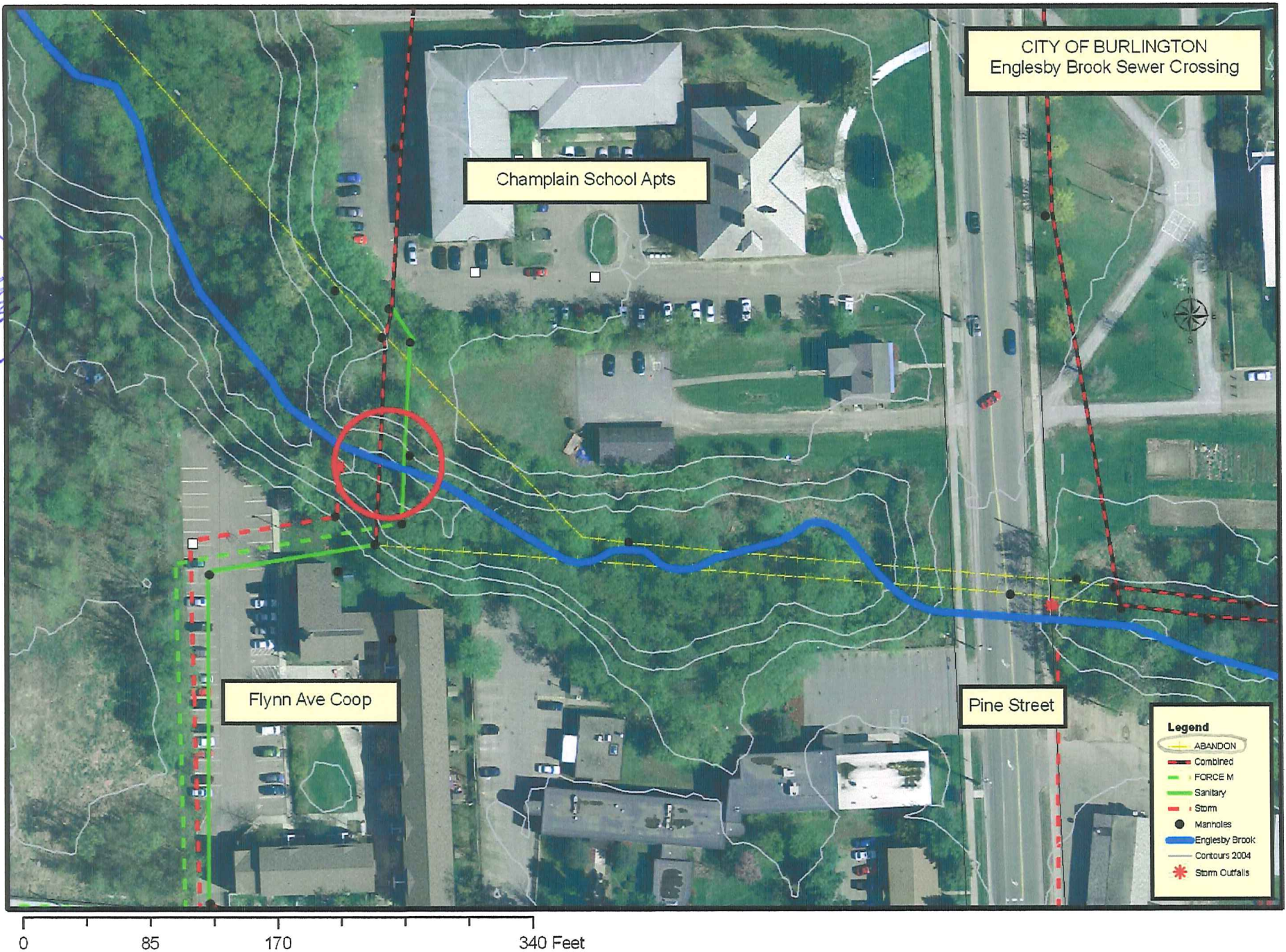
Englesby Brook Sewer Crossing



Legend

- Englesby Brook
- - - rail
- Buildings
- Streets
- Parcels
- Manholes
- Contours 2004
- Combined
- Sanitary
- Storm

0 220 440 880 Feet



CITY OF BURLINGTON
Englesby Brook Sewer Crossing

Champlain School Apts

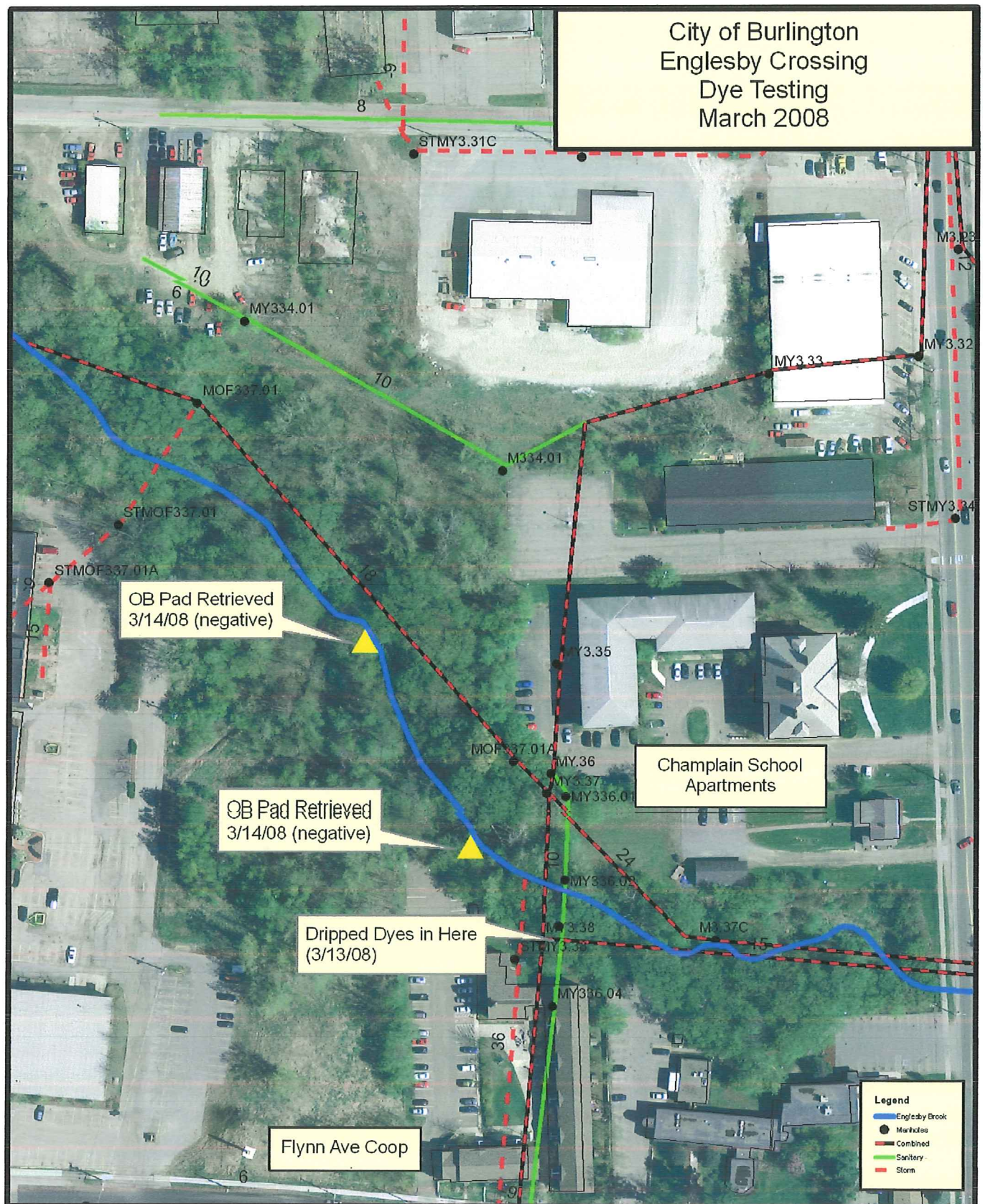
Flynn Ave Coop

Pine Street

- Legend**
- ABANDON
 - Combined
 - FORCE M
 - Sanitary
 - Storm
 - Manholes
 - Englesby Brook
 - Contours 2004
 - Storm Outfalls

RECEIVED
JUL 24 2009
CIVIL ENGINEERING

City of Burlington
Englesby Crossing
Dye Testing
March 2008



0 75 150 300 Feet

Steve Goodkind, P.E.
PUBLIC WORKS DIRECTOR



P.O. Box 849
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(802) 863-0466 F

December 8, 2006

Dennis Bryer, P.E.
Environmental Engineer
VTDEC - Wastewater Management
103 South Main St., The Sewing Building
Waterbury, VT 05671-0405

Re: Response to Verbal Questions on Main Plant Revised Electric Power Failure Plan

Dear Mr. Bryer,

When we spoke the week of Nov. 13, you had a few questions regarding our latest revised Electric Power Failure Plan (EPFP) for Main Plant, dated 11/3/06. Here is our response to your questions:

Battery Backup for Older Alarm Systems

Our pump stations that had alarm dialers previous to this summer (Flynn, Proctor, BHS and South Cove) do have battery backup and will dial out alarms during power failures. This fact was stated in the March 2006 letter to you from Laurie Adams regarding Riverside WWTF inspection (attached).

Status of Pine Street Pump Station

The EPFP mentioned that our Pine Street pump station that according to the pump station group serves only the Public Works building is in poor condition and had one pump down when originally inspected in 2005. The submersible pump in question has been repaired with the current problem being that pump's controls. If a pump fails again, their plan is to wire the good pump to the functioning controls.

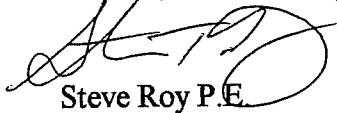
Our sewer maps show the gravity line feeding this station running 500' down Lakeside Avenue and picking up wastewater from other properties. While our report mentioned looking into the feasibility of connecting Public Works into a gravity line and decommissioning this station, we will have to first determine if there are indeed additional users. The engineering group will look into the future of this station over the winter and have a response to your department by April 1, 2007.

Lakeside Ave Alarm System

The station on Lakeside that serves two (2) houses has an alarm system consisting of only a light with no horn or battery backup. In the attached March letter to you the City responded that we do not agree with installing an auto dialer or audio alarm at this location, given the ample storage capacity. It is our understanding that you concurred with our decision.

This is my recollection of our telephone conversation. If you need additional information please let me know.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Roy", with a large, stylized loop at the end.

Steve Roy P.E.
Project Engineer

cc: Laurie Adams, Gary Greenwood, Tim Grover

Steve Goodkind, P.E.
Public Works Director

Laurie Adams
Assistant Director



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March 17, 2006

Dennis Bryer, P.E. Environmental Engineer
State of Vermont ANR
Wastewater Management Division
103 South Main St-Sewing Building
Waterbury, VT 05671-0405

Re: Permit #3-1247 Burlington Riverside WWTF Inspection

Dear Mr. Bryer:

I am responding to your latest comments in your letter of February 15, 2006 resulting from the August 30, 2005 inspection. I will respond to your numbered order. I may also refer to your February 17, 2006 letter to Steve Roy as some items are addressed in both.

1. We take exception to the need to make improvements to the Lakeside Avenue pump station. As you note this station only serves two houses and has ample emergency storage volume. This station has a calculated minimum storage capacity of 7.4 hours at peak flows and storage capacity of 1.2 days at average flows. We do not agree with installing an auto dialer or audio alarm at this location. Leddy Park pump station only serves the Park Department arena. The alarm is inside the building and the only time flow occurs is when people are using the arena. Furthermore, if the station failed the well would fill up and back up into the Park Department building and not overflow.

2. The following is an update to the seven pump stations we indicated would be complete by March 1, 2006. This has been much more complicated than we originally anticipated due to the coordination of obtaining new phone numbers from one provider (Telecom), confirming line activity as in dial tone (Telcove), conduit installation (All Seasons Excavating), installation of phone lines (Verizon), dialer installation (Omega Electric), and coordination of new accounts with Home Security. Telecom has assigned new phone numbers. Dialer installation should be complete by the end of next week. All dialers, both existing and these new dialers have battery back up. Conduit installation was required at Appletree Point and that is complete. **Until such time as all seven stations are active we have put into motion physical checking of the stations every eight hours by a plant operator.** The only exception to this will be North Beach Lower, as this station is seasonal only, currently offline, no flow. Lastly, Burlington Electric has

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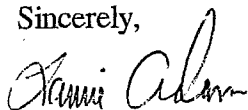
added these stations to their dispatch list to notify our staff in the event of a power outage.

3. The sizing of the pump stations was calculated using the methodology as stated.

4. Burlington Electric is in the process of analyzing their outage information to see if there is any history or experience of several sewage pump stations being interrupted simultaneously.

We will provide confirmation to the final completion of the seven pump stations as soon as possible. I will provide an update no later than April 30, 2006. If you have any questions please call me at 802-863-4501.

Sincerely,

A handwritten signature in cursive script, appearing to read "Laurie Adams".

Laurie Adams
Assistant Director

CC: Gary Greenwood, Chief Operator Riverside
Steve Roy, DPW Project Engineer
Carol Duncan, DPW Engineer

An Equal Opportunity Employer

For access to a TTY line (for persons with hearing impairments), call 802-863-0450



CITY OF BURLINGTON
DEPARTMENT OF PUBLIC WORKS

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Steven Goodkind, P.E.
DIRECTOR OF PUBLIC WORKS
CITY ENGINEER

October 5, 2005

Mr. Dennis Bryer, P.E., Environmental Engineer
Department of Environmental Conservation
Wastewater Management Division
103 South Main Street
Waterbury, VT 05671

Dear Mr. Bryer:

This letter is in response to your request for detailed information regarding prioritization of work to be completed at the city's sewage pump stations. Our priority list was created by examining necessary upgrades for both telemetry and emergency power and determining which stations are in the most critical need. The upgrades will be completed over a number of years as the city attempts to balance its wastewater capital needs and existing fiscal constraints.

In your September 7, 2005 letter, you noted that twelve of the twenty-three pump stations are in close proximity to Lake Champlain and of those twelve, just five are equipped with telemetry for alarm systems. We have identified six of twelve stations near the lake or river that are equipped with dialers and seven stations in need of this upgrade. The stations with telemetry are Burlington High School, North Beach Upper, Crescent Beach, Flynn Avenue, Proctor Place and South Cove. Those stations requiring telemetry upgrades are College Street, Perkins Pier, North Beach Lower, Lake Street, Mill Street, Appletree Point and Queen City Park Road. The city will install phone lines and/or radio call boxes at these seven stations. Our plan is to install phone lines at these stations within the next six months while we continue to research whether or not radio equipment is appropriate and more cost effective for the city.

Your letter also discussed the various upgrades needed at many of the city's pump stations as part of the electric power failure plans for the three wastewater treatment facilities. Emergency power is the city's preference for dealing with power failure at the pump stations. Adding emergency power requires the installation of a generator at each station which can be expensive and requires the storage of emergency fuel onsite. Storage tanks are more self sufficient, less intrusive and more economical than emergency power. This includes time to receive the callout, traveling to the station, troubleshooting and round trip travel from the station to the plant to receive necessary equipment. The following stations require additional emergency storage capacity. The city has estimated that it may take up to 1.5 hours for pump station personnel to

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respond to power failures. Emergency storage upgrades are based on adding storage for 1.5 hours unless otherwise noted.

Main Plan Pump Stations

The **North Beach Upper** pump station is located east of North Beach and services the lower beach station, Rock Point School and North Beach's campsites in the summer. Flow from this station is pumped to the Burlington High School Station. The North Beach Upper pump station is a 10 foot by 6 foot vault over a 4 foot diameter wet well. This station currently has 440 gallons of emergency storage. Based on a peak day flow of 16,632 gallons and a 2 hour response time, this station requires an additional 2000 gallons or 278 cubic feet. However, because this station has virtually no storage at this time, adding more storage than is required by the two hour peak day storage volume seems prudent. Therefore, a storage tank 7 feet by 14 feet by 5 feet deep (490 cubic feet) will be added for an additional storage volume of 3,500 gallons. This alarm system at this station consists of a dialer, light and bell. The longest power outage that occurred at this station in the last five years is 0.77 hours.

The **Proctor Place** station is located at the end of Proctor Place near Englesby Brook. It services homes along Harrison, Central, Wright and Conger Avenues. It also picks up four catch basins in this neighborhood. This station has a 6 foot diameter wet well that is over 20 feet deep. It currently has approximately 5,200 gallons of storage. With a peak day flow of 7,590 gallons and a 2 hour response time, an additional 4,900 gallons (660 cubic feet) of storage is needed. Two tanks measuring 7 feet by 14 feet by 3.5 feet deep (686 cubic feet) would accommodate this volume. This station's alarm system consists of a phone dialer and bell. The longest power outage at this station in the past five years was 1.02 hours.

The **South Cove** pump station is a wet/dry system located near South Cove's private beach and services approximately 70 homes along South Cove and Dunder Roads. This station currently has approximately 3,600 gallons of emergency storage. The longest power outage at this station in the past five years was 1.87 hours so a response time of 2 hours was used with a peak day flow of 55,200 gallons to calculate an additional storage need of 3,300 gal (445 cubic feet). A storage tank 8 feet by 14 feet by 4 feet deep (448 cubic feet) would accommodate this volume. This station's alarm system consists of a phone dialer, light and bell.

Riverside (East) Plant Pump Stations

The **Mill Street** pump station is a 12 foot by 7 foot wet well located on Mill Street near the Chase Mill. This station is located approximately 130 feet from the Winooski River. This station currently has 2,680 of emergency storage. Because these stations have been subject to relatively long power outages over the past five years, response time of 4.5 hours will be used to calculate storage volume. With a peak day flow of 13,835 gallons and a response time of 4.5 hours, 3,890 gallons of storage needed which amounts to an additional volume of 1210 gallons (162 cubic feet). A storage tank 7 feet by 7 feet by 3.5 feet deep (172 cubic feet) would accommodate this volume. The upgrade to this system will include a new phone dialer alarm system. Although a specific technology has not yet been selected, a general price for this work has been included in the estimate.

North Plant Pump Stations

The **Appletree** pump station is located on Appletree Point Road in the city's north end. It is a submersible system servicing homes along Appletree Point Road and the Strathmore neighborhood. In the electric failure plan submitted to your office by the city on December 23, 2004, the city suggested that the Appletree Point Road pump station be further studied to determine the need for additional storage or emergency storage capabilities. The Appletree Point Road pump station has a peak flow of 78,095 gallons based on a 16 hour day and a current storage of 9,500 gallons. This represents storage for 1.9 hours during peak flow power failures. Based on the fact that the longest power outage over the past five years was 0.57 hours and the average response time is 1.5 hours, the city believes that this station has adequate capacity. This station will have a new phone dialer system installed as part of the city wide telemetry upgrade. A proposed development in this area, if permitted, would be connected to this pump station. In that case, the developer would be required to add storage capacity and perform any other upgrades to the pump station necessitated by the additional flow.

The **Crescent Beach** pump station is a wet/dry system with a six foot diameter wet well located at the end of Crescent Beach Drive in the city's north end. Similar to the Appletree Point station, in its electric power failure plan for the North Wastewater Treatment Plan, the city suggested that the storage capacity of this station be further studied. The Crescent Beach station has a peak flow of 82,152 gallons and current storage of 8,500 gallons. This storage volume represents 1.7 hours of storage during peak flow. Based on the fact that there were no power outages in the last five years at this station and the average response to power outages is 1.5 hours, the city believes that this station has adequate capacity. This station has a phone dialer as part of its alarm system. No upgrades are planned at this station.

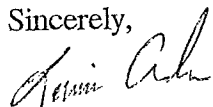
The **Van Patten** pump station is a submersible pump system with a 6.5' diameter wet well located on Van Patten Parkway in the city's north end. In the electric failure plan submitted to your office on December 23, 2005, the city suggested that the storage capacity of this station be further studied. Based on the peak day flow of 30,850 gallons and an available storage volume of 3,200 gallons representing a storage time of 1.7 hours during peak flow, the city believes that additional storage should be added to this station. The longest power outage at this station in the last five years was 1.6 hours. The addition of a storage tank to increase the peak day storage time to 2 hours will provide adequate capacity. The addition of a 1,000 gallon storage tank will provide a peak day storage time of 2.2 hours. The city will install a storage tank 6 feet by 6 feet by 4 feet (144 cubic feet) which will add 1077 gallons of additional storage at this station. This station is not equipped with a phone dialer but one will be added as part of the upgrade.

The following table provides a summary and prioritization of the upgrades to the pump stations discussed above.

Pump Station	Planned Upgrade	Total Storage (gal)	Min. Storage Time (hrs)	Capital Cost	Completion Date
College Street, Perkins Pier, North Beach Lower, Appletree Point, Lake Street Queen City Park Road, Mill Street	Installation of phone line and/or radio call box	N/A	N/A	\$12,000	March 1, 2006
North Beach Upper	Storage Tank (490 cf)	4,106	3.9	\$11,250	June 30, 2006
Proctor Place	Two Storage Tanks (686 cf)	10,332	2.0	\$21,500	June 30, 2007
South Cove	Storage Tank (448 cf)	6,951	2.0	\$10,500	June 30, 2008
Van Patten	Storage Tank and Phone Dialer Alarm	4,277	2.2	\$9,250	June 30, 2009
Mill Street	Storage Tank	3,890	4.5	\$7,750	June 30, 2010
Total Cost				\$72,250	

If you have any questions, please contact me at 863-4501.

Sincerely,



Laurie Adams

Assistant Director Burlington Public Works

Steve Goodkind, P.E.
PUBLIC WORKS DIRECTOR



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November 3, 2006

Dennis Bryer, P.E.
Environmental Engineer
VTDEC – Wastewater Management
103 South Main St., The Sewing Building
Waterbury, VT 05671-0405

Re: Electric Power Failure Plan for Main Plant, Permit 3-1331

Dear Mr. Bryer,

This letter is the City's final revision to the Main Plant Electric Power Failure Plan (EPFP) as required in Section H of Main plant's 7/1/05 discharge permit. It is a modification of the original July 2005 EPFP that includes additional information that you have requested since our first submittal. In lieu of just responding to your requests, we resubmit this EPFP as a standalone document that makes this information more readily available.

Treatment Plant

Main plant has a 750 KW generator on-site that is capable of handling critical electrical load of the plant. Major equipment served by this generator include: dry weather screening, dry weather pumping, dry weather controls, CSO screening, CSO pumping, CSO controls, dry weather and CSO hydraulically activated sluice gates, headworks safety equipment (gas detection, ventilation, lighting, fire alarms), grit system air blower, primary clarifiers, primary sludge grinders/pumps, grit safety equipment (gas detection, ventilation, lighting, fire alarms), aeration blowers 4 & 5 (75 HP), disinfection systems (chlorine and bromine), RAS pumps 1-3, WAS pumps 1-2, control building safety equipment (lighting, fire alarms), administration building safety equipment (lighting, fire alarms), and SCADA equipment (main and remote PLCs). This plant can operate for extended periods of time (i.e. hours to days) depending on oxygen demand of the biological system and available sludge storage capability at the time of power failure.

This generator is maintained as required and is exercised weekly to ensure proper operation. Coupled with this generator is an automatic transfer switch (ATS) that controls the generator and transfers load from line to generated power and back as necessary.

Main plant has an alarm dialer with battery backup to alert the operators of problems. While there is no specific alarm point for a power outage, other alarms such as aeration blower failure,

disinfection pump failure and others go out simultaneously to a security service which pages the operator on call. Given the presence of multiple alarms at once an operator can quickly deduce that there has been a power failure.

Pump Stations

There are a total of twelve (12) municipal pump stations located in the Main plant collection system. Each station is discussed below while a table at the end of this document summarizes these stations along with required information, including stations that were updated with alarm telemetry. All stations have signage on the exterior indicating that it is a wastewater lift station and if the alarm is ringing call the phone # listed. Flowrates are derived from hour meter readings along with pump flow data from drawdowns in 2005. Peak spring flows are the highest daily readings from the March through May time period estimated to be delivered over a 16 hour period. Using hour meters to calculate pump station flows has its advantages and disadvantages. Some of the advantages are its availability in all pump stations and its better reliability over current wastewater flow meter technology. However one of its disadvantages is that it cannot determine flow or pump problems and will yield unusually high hour meter readings when pumps run longer than normal due to hydraulic issues or trip out due to electrical problems. Therefore, one must sometimes review the hour meter data and potentially discount data points that are grossly inconsistent with surrounding data. The methodology used in this report involved a series of tests, which were:

1. Comparing individual pump hour meter readings to each other plus to dates before and after the data in question.
2. Comparing one pump's runtime hours to its alternate. If they were grossly different, then chances are good that a given pump had hydraulic or electrical problems.
3. Comparing calculated flows to Environmental Protection Rule standards for daily water/wastewater usage and peaking factors.

Attached to this report is a corrected power outage data spreadsheet supplied by Burlington Electric Department (BED). It shows the line/feeder that supplies each station, dates and duration of recorded outages as well as a note that describes whether the outage was localized or the entire line/feeder. A section later in this report will discuss how operations personnel should handle line/feeder problems where multiple stations may be out of service.

Burlington High School has a wet/dry pump station located within a multi-use building adjacent to its football field. In addition to the station, this building houses boys/girls bathrooms and an equipment storage room. This station's alarm system consists of a phone dialer. Over the last three years, the average flows to this station are 13,200 gals/day. A questionable peak flow of 42,274 gpd (gallons per day) was calculated using pump hour meters on 4/19/04. With readings of 19,299 and 6,698 gpd on either side of this value and no recorded rainfall, I believe that an incorrect date was written by the operator in the field or into the database. The second highest flow of 30,326 gpd will be used for storage time calculations. Given an estimated storage volume of 1,600 gals, the minimum calculated emergency storage time is 0.84 hours. The longest reported power outage from 2000 through 2005 was 1.55 hours in 2000, so this station would not meet state storage requirements. Note that a new pump station with greater emergency storage is planned as part of the track and field upgrade, with a spring 2007 completion.

The **College Street** pump station is a wet/dry system located at the end of College Street adjacent to UVM's Rubenstein Laboratory and ECHO at the Leahy Center for Lake Champlain. In addition to its 8 foot diameter wet well, the station has two emergency storage tanks directly connected to the well and one tank on the upstream gravity sewer from the lab. The average flows to this station are 49,000 gals/day. Like the High School station, a questionable peak flow of 102,851 gpd was recorded on 3/5/04. Given that individual pump hour meter readings had a difference of 40.3 and 4.5 hours from the previous readings and the system is set to alternate pumps for equal runtime, I am throwing out this data point and using the next highest peak spring day flow of 73,605 gpd. With an estimated storage volume of 9,500 gals, the minimum calculated emergency storage time is 2.1 hours. The longest reported power outage from 2000 through 2005 was 2 minutes (0.03 hours), so the station meets state storage requirements. This station was supplied with a new control panel in 2003 as part of the ECHO construction that includes hookup for an emergency generator. A telephone alarm dialer with battery backup was installed in this station during the summer of 2006.

The **Flynn Avenue** pump station is a wet/dry system located near the entrance to Oakledge Park and services businesses and homes west of the railroad crossing on Flynn Avenue. This station's alarm system consists of a phone dialer. In addition to its 6 foot diameter wet well, emergency storage volume includes 290 feet of 8 inch gravity pipe and two manholes. The average flows to this station are 31,560 gals/day and the peak day recorded spring flow was 59,816 gals. With an estimated storage volume of 10,650 gals, the minimum calculated emergency storage time is 2.8 hours. The longest reported power outage from 2000 through 2005 was 1.18 hours in 2003, so this station meets state storage requirements.

The **Lake Street** pump station is the newest station that was taken over by Public Works in the fall of 2004. It served the newly constructed Depot Street apartment building and is a submersible station with a 6 foot diameter concrete wet well, two pumps and US Filter/Consolidated Electric control panel. This station pumps wastewater to a gravity line on Lake Street that flows into the College Street pump station. Given the limited storage of College Street PS, a telemetry system was installed that disables Lake St. PS when College is experiencing high wet well levels. Alarm system consists of a light and horn plus an alarm that rings at the apartment building. In addition, a telephone alarm dialer with battery backup was installed in this station during the summer of 2006. The average flows to this station are 3,225 gals/day and a peak day recorded spring flow was 5,220 gals in April 2005. With an estimated storage volume of around 1,000 gals, the minimum calculated emergency storage time is 3.1 hours. The longest reported power outage from 2000 through 2005 was 0.27 hours in 2001, so this station meets state storage requirements. Additional storage volume can be easily obtained by lowering the alarm setpoint.

Lakeside Avenue has a small station located near the railroad underpass and services two houses on the hill off Lakeside. This station is a submersible type with a 9 foot by 5 foot vault over a 4 foot diameter wet well. An alarm system for this station includes a light. Using raw hour meter readings the average flows to this station are calculated to be 2,115 gpd, but this average is grossly skewed by hour meter readings that correspond to flows up to nearly 60,000 gpd.

Knowing that this station services only two houses, I reviewed the data and threw out any calculated flowrates in excess of 2100 gpd. This value corresponds to Environmental Protection Rules allowances of 210 gpd per single family residence multiplied by a peaking factor of 5. The recalculated average daily flowrate was 780 gpd and the peak was 1,978 gpd. With an emergency storage capacity of 920 gals, the minimum calculated emergency storage time is 7.4 hours. The longest reported power outage from 2000 through 2005 was 1.18 hours in 2003, so this station meets state storage requirements.

The **North Beach Lower** station is located at the beach and services only the beach house. This station is a wet/dry type with a 10 foot by 6 foot vault over a 4 foot diameter wet well. This station's alarm system for this station includes a bell. The average flows to this station are calculated at 700 gals/day when the beach house is typically open from Memorial day to Labor day. After throwing out an unbelievable 22,176 gpd, the next peak flowrate was 1,876 gpd. With an emergency storage capacity of 160 gals, the minimum calculated emergency storage time is 1.4 hours. The longest reported power outage from 2000 through 2005 was 1.17 hours in 2005, so this station meets state storage requirements. Note that during emergencies water could easily be shut off to the beach house. A telephone alarm dialer with battery backup was installed in this station during the summer of 2006.

North Beach Upper station is east of the beach and services the lower beach station, Rock Point School and North beach's campsites in the summer. It pumps flow to the Burlington High School station. This station's construction is similar to the lower station, with a 10 foot by 6 foot vault over a 4 foot diameter wet well. The differences are that its pumps are larger and the alarm system consists of an alarm dialer with battery backup, light and bell. Using hour meter readings to calculate flows, this station had daily flowrates that often exceeded the High School station. I compared both stations and reviewed peak spring day flowrates where this station was less than the High School. A peak day of 16,632 gals was determined to be believable. This station was converted to a submersible pump station during the summer of 2006 with the vault modified to provide emergency storage. Combined with the collection system, a total storage volume of around 4,700 gallons has been calculated. At the above peak day flow an emergency storage time of 4.5 hours has been calculated. The longest reported power outage from 2000 through 2005 was 1.17 hours in 2005, so this station now meets state storage requirements. While the new pumps were rated for 125 gpm (gals per minute), flow testing on 6/29/06 yielded actual pump rates of 82 and 79 gpm. A pressure gauge should be installed on the force main to determine actual pump TDH (total dynamic head).

Perkins Pier has a small station located adjacent to and serves a small brick office building at the pier. This station is a submersible type with a 5 foot diameter wet well. An alarm system for this station includes a light and bell. There is little to no flow at this station for pump drawdown testing, but the last plan had given average station flows of 300 gpd and peak day recorded spring flow was 764 gals which gives this station an acceptable 17 hours of minimum storage time. The longest reported power outage from 2000 through 2005 was 2 minutes (0.03 hours), so the station meets state storage requirements. A telephone alarm dialer with battery backup was installed in this station during the summer of 2006.

The **Pine Street** station is located on the east side of the Pine Street/Lakeside intersection. It was thought to be abandoned but had to be resurrected to serve the Public Works building on the opposite side of Pine Street. Given the poor condition of this station and its single building service, high hour meter reading with corresponding flows in 2005 of tens of thousands of gallons were dismissed as pump problems. An average flow of 634 gpd and spring peak flow of 792 gpd is much more defensible. In the case of this building, I would divide this peak flow by 10 hours instead of 16 hours to yield an hourly flow of 79 gals. I was not able to find the alarm float but given the pump operation level an emergency storage volume of around 650 gals is possible. That volume would result in an emergency storage time of around 8 hours. According to the revised BED spreadsheet, this station has not been out of power over the last five years. Given the condition of this station, a gravity sewer lateral from the Public Works building should be explored if feasible.

The **Proctor Place** pump station is a wet/dry system located at the end of Proctor Place near Englesby Brook and services homes along Harrison, Central, Wright and Conger Avenues. Part of its collection system is combined sewer as it picks up approximately four catch basins in that neighborhood. The average flows to this station are 33,700 gals/day and the peak day calculated spring flow was 80,940 gals in April 2004. This station's alarm system consists of a phone dialer and bell. An emergency storage volume of 5,200 gals was determined from the last emergency plan. In addition to its 6 foot diameter wet well, emergency storage volume includes 250 feet of 8 inch sewer, 220 feet of 10 inch sewer, 250 feet of 12 inch pipe and connecting manholes. Assuming there are basements in houses near the station, emergency storage was calculated to 5 feet below the station's wet well rim. With this storage capacity, the minimum calculated emergency storage time is around 1 hour. The longest reported power outage from 2000 through 2005 was 3.52 hours in 2004, so this station needs either to have additional storage, a permanently mounted generator or to have catch basins removed if possible from the station's collection system. This station is slated for rehabilitation in 2007.

The **South Cove** pump station is a wet/dry system located near South Cove's private beach and services approximately 70 homes along South Cove and Dunder Roads. This station's alarm system consists of a phone dialer, light and bell. The average flows to this station are 23,760 gals/day and the peak day calculated spring flow was 55,200 in April 2005. During the last failure plan, this station had very high flows and was believed to be influenced by surface or groundwater. Late 2003 it was found that a homeowner on South Cove Road had a catch basin on their property attached to their sewer service. Once this basin was disconnected, peak flows to this station reduced significantly. In addition to its 6 foot diameter wet well, the emergency storage volume of 3,600 gals includes a total of 780 feet of 8 inch sewer and four connecting manholes. Assuming basements in houses near the station, emergency storage was calculated to 5 feet below estimated grade of the nearest house. With this emergency storage volume, the minimum calculated emergency storage time is 1.5 hours. The longest reported power outage in the last 5 years was 1.17 hours in 2005, so this station meets state storage requirements. Given the fact that this storage barely gives the operator enough time to respond to a callout, a storage tank of at least 3500 gals is recommended for this station.

The **Queen City** pump station is a wet/dry system located at the end of Pine Street and services homes along Pine Street and Queen City Parkway. The average flows to this station are 47,600 gpd and the peak day calculated spring flow was 109,700 gals in April 2004. This station's alarm system consists of a telephone alarm dialer with battery backup that was installed in this station during the summer of 2006 and light. An emergency storage volume of 10,650 gals was calculated using this station's twin 8 foot diameter wet wells that are over 21 feet deep as well as surrounding collection system. With this emergency storage volume, the minimum calculated emergency storage time is 1.6 hours. The revised BED spreadsheet shows no power outages to this station from 2000 through 2005. Given the flows to this station, review of float settings is recommended to maximize storage volume.

PUMP STATION SUMMARY

Pump Station	Design Pump Flow GPM	2005 Pump Flows GPM	Annual Average GPD	Spring Peak GPD	Avail. Storage GALS	Min. Storage Time HRS	Longest Outage HRS	COMMENTS
Burlington High Sch.	400	460/459	13,200	30,326	1,600	0.84	1.55	New station planned
College Street	300	306/316	49,000	73,605	9,500	2.1	0.03	Has alarm telemetry
Flynn Avenue	300	180/176	31,560	81,615	10,650	2.8	1.18	
Lake Street	120	169/194	3,225	5,220	1,000	3.1	0.27	
Lakeside Avenue	55	23/see comment	780	1,978	920	7.4	1.18	No flow for pump 2 test
North B. Lower	150	66/41	700	1,876	160	1.4	1.17	
North B. Upper	125	82/79	13,237	16,632	4,700	4.5	1.17	This station was rebuilt in 2006.
Perkins Pier	40	see comment	300	764	2,000	17	0.03	No flow. Used last report's data
Pine Street	160	36/see comment	634	792	650	8	No reported outages	Pump 2 down. Look at gravity sewer
Proctor Place	300	178/208	33,700	80,940	5,200	1	3.52	Needs storage, gen-set or CB removal
South Cove	125	125/118	23,760	55,200	3,600	1.5	1.17	Peak flows down. Storage tank is still recommended
Queen City	see comment	135/127	47,600	109,700	10,650	1.6	No reported outages	Design flow unavailable

Line/Feeder Outages

As can be seen on the chart below and attached BED spreadsheet, there are groupings of pump stations on the same line/feeder that would all be affected if the entire feeder goes down. The purpose of this section is to summarize this information and suggest a strategy during widespread outages. This summary encompasses all our stations, not just the ones flowing to Main Plant. The numbers in parenthesis next to each station on the strategy column corresponds to minimum calculated storage times based upon spring flows in this and previous Electric Power Failure Plans.

LINE/FEEDER SUMMARY

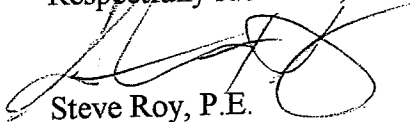
Line/Feeder ID	Station(s) Affected	Strategy for Line/Feeder Outage
City Feeder #1	Appletree Point, Leddy Park, North Beach Upper, North Beach Lower	Attend to Appletree first (2), North B. Lower (1.4), North B. Upper (4.5) and then Leddy (6.6)
City Feeder #4	College Street, Perkins Pier	Attend to College Street (2.1) first and then Perkins (17)
East Ave Line #1	Chase Street, Intervale Landfill, Lake Street, McNeil Plant, Mill Street	Attend to Mill Street (3.1) first, then Chase (7.7), Lake (?), McNeil (9.5), and Intervale (?)
East Ave Line #2	Birch Court, Brook Drive, Burl. High School, Lori Lane, Van Patten	Attend to Van Patten (1.7) first, then High School (4+), Brook (10.1), Lori (27.7) and Birch (49.8)
East Ave Line #4	Fletcher Place	Fletcher Place (4.2)
Queen City Line #3	Pine Street	Pine Street (8)
Queen City Line #4	Flynn Ave, Lakeside Ave, Proctor Place, South Cove Road	Attend to Proctor (1), then South Cove (1.5), Flynn (2.8) and Lakeside (7.4)
Queen City RS	Queen City Park	Queen City Park (1.6)
Sub #1/Feeder #2	Crescent Beach	Crescent Beach (1.7)

Here is suggested strategy for handling line/feeder outages:

1. If there is a feeder outage, the on-call person will get pages for multiple stations being offline. Pick up a tanker truck hose(s) stored at one of the treatment plants and go to the first station on the above chart.
2. Check the wastewater level in this station. If levels are low, contact BED to determine whether they are aware of the situation and get a time estimate for repair. If wastewater levels are high at the first station, pump out the wet well.
3. If the feeder out involves multiple stations with low storage capacities, or the flows are coming in fast, or if BED states the repairs will take hours, consider contacting a backup operator and truck.
4. Discharge pump station wastewater into the closest gravity sewer manhole that doesn't place the operator or equipment at risk for traffic issues.

5. Go back to the first station. If levels are acceptable, travel to the next station on the above list and repeat lines 2 through 4 above.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Steve Roy', is written over the typed name.

Steve Roy, P.E.
Project Engineer

cc: Laurie Adams, Gary Greenwood, Tim Grover

main_epfp_2005revA.doc

Wastewater Pump Station Electric Supply Data

(Jan. 2000 Though Dec. 2005, corrected 10/17/06 by Burlington Electric Department)

Station Location	Line / Feeder	Outage Date	Start Time	End Time	Duration	Discription Feeder or Localized
Leddy Park	City Feeder Line # 1	9/15/2000	9:03	9:37	34 min.	Feeder
Appletree Point	City Feeder Line # 1 Lake St.	9/15/2000	9:03	9:37	34 min.	Feeder
North Beach Lower	City Feeder Line # 1 Lake St.	9/15/2000	9:03	9:37	34 min.	Feeder
North Beach Upper	City Feeder Line # 1 Lake St.	9/15/2000	9:03	9:37	34 min.	Feeder
College Street	City Feeder Line # 4 Lake St.	5/10/2000	15:36	20:18	2 min	Feeder
Perkins Pier	City Feeder Line # 4 Lake St.	5/10/2000	15:36	20:18	2 min	Feeder
Chase Street	East Ave. Line # 1	6/15/2000	15:22	15:45	23 min.	Localized
Interval Landfill	East Ave. Line # 1					
Lake St. & Depot St.	East Ave. Line # 1					
McNeil Plant	East Ave. Line # 1	6/15/2000	15:22	15:45	23 min.	Localized
Mill Street	East Ave. Line # 1	6/15/2000	15:22	15:45	23 min.	Localized
Birch Court	East Ave. Line # 2	8/10/2000	10:54	12:27	1 hr. 33 min.	Localized
Brook Drive	East Ave. Line # 2	8/10/2000	10:54	12:27	1 hr. 33 min.	Localized
Burlington High School	East Ave. Line # 2	8/10/2000	10:54	12:27	1 hr. 33 min.	Localized
Lori Lane	East Ave. Line # 2	8/10/2000	10:54	12:27	1 hr. 33 min.	Localized
Van Patten Drive	East Ave. Line # 2	8/10/2000	10:54	12:27	1 hr. 33 min.	Localized
Fletcher Place	East Ave. Line # 4	2/21/2004	11:11	12:35	1 hr. 24 min.	Feeder
Pine Street	Queen City Line # 3					
Flynn Avenue	Queen City Line # 4	9/11/2002	12:01	12:18	17 min.	Feeder
Lakeside Avenue	Queen City Line # 4	9/11/2002	12:01	12:18	17 min.	Feeder
Proctor Place	Queen City Line # 4	9/11/2002	12:01	12:18	17 min.	Feeder
South Cove Road	Queen City Line # 4	9/11/2002	12:01	12:18	17 min.	Feeder
Queen City Park	Queen City RS					
Crescent Beach	Sub #1 / Feeder # 2					

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Steve Goodkind, P.E.
PUBLIC WORKS DIRECTOR



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December 23, 2004

Dennis Bryer, P.E.
Environmental Engineer
VTDEC – Wastewater Management
103 South Main St., The Sewing Building
Waterbury, VT 05671-0405

Re: Electric Power Failure Plan for North Plant, Permit 3-1245

Dear Mr. Bryer,

This letter is the City's response to an updated Electric Power Failure Plan (EPFP) as required in Section H of North plant's latest discharge permit.

Treatment Plant

North plant has a 500 KW generator on-site that is capable of handling the entire electrical load of the plant. This generator is maintained as required and is exercised weekly to ensure proper operation.

While this facility doesn't have a specific alarm for a power outage, battery-backed alarms would go out for operational failure of key pieces of equipment if either the generator failed or the equipment failed to restart. We feel that these alarms are more useful than a general AC power failure alarm that becomes a nuisance when the generator is operating properly.

Pump Stations

There are a total of seven (7) municipal pump stations located in the North plant collection system. A table on the next page lists these stations along with pertinent information. The flowrates are derived from hour meter readings along with the last pump rate information. Peak spring flows are the highest readings from the March through May time period. Using hour meters to calculate pump station flows has its advantages and disadvantages. Some of the advantages are its availability in all pump stations and its better reliability over current wastewater flow meter technology. However one of its disadvantages is that it cannot determine flow or pump problems and will yield unusually high hour meter readings when pumps run longer than

normal due to hydraulic issues or trip out due to electrical problems. Therefore, one must review the hour meter data and potentially discount single data points that are grossly inconsistent with surrounding data. The methodology used in this report involved a series of tests, which were:

1. Comparing individual pump hour meter readings to each other plus to dates before and after the data in question.
2. Comparing one pump's runtime hours to its alternate. If they were grossly different, then chances are good that a given pump had hydraulic or electrical problems.
3. Performing a statistical analysis on the data. If the flowrate in question was beyond three standard deviations of the entire data set, then this data was considered erroneous.

Pump Station	Design Average GPD	Design Peak GPD	Annual Average GPD	Spring Peak GPD	Avail. Storage GALS	Min. Storage Time HRS	Longest Outage HRS	COMMENTS
Appletree Point	118,125	378,000	48,873	78,095	9,500	2.0	0.57	Storage time similar to last reporting period of 2.3 hrs.
Birch Court	18,171	76,320	2,528	2,892	9,000	49.8	1.55	Storage time similar to last reporting period of 41.9 hrs.
Brook Drive	19,714	82,800	4,281	5,842	3,700	10.1	1.55	Storage time reduced from 12.3 hrs last period.
Crescent Beach	63,900	204,480	41,211	82,152	8,500	1.7	0	Storage time similar to last reporting period of 1.6 hrs.
Leddy Park	41,400	132,480	3,808	4,265	1,750	6.6	0	Storage time greater than 3.1 hrs last period.
Lori Lane	17,829	74,880	4,647	6,942	12,000	27.7	1.55	Storage time similar to last reporting period of 28.9 hrs.
Van Patten	69,075	221,040	18,548	30,850	3,200	1.7	1.55	Storage time similar to last reporting period of 1.2 hrs.

Here are our observations from the above table:

- Birch Court, Brook Drive, Lori Lane and Van Patten were all affected by the same power outage. In the event of a similar outage, Van Patten is the station that needs first response.
- Appletree Point, Crescent Beach and Van Patten stations should be further studied for additional storage and/or emergency power capabilities.
- Crescent Beach storage was recalculated from the last report to include collection system storage.
- The above chart shows a rapid response from Burlington Electric in correction of power outages.

As in previous power failure plans, it has been estimated that depending on the time of day it may take up to 1.5 hours for pump station personnel to respond to power failures. This includes receiving the callout, travel to the station, troubleshooting, and round trip travel from the station to the plant to retrieve necessary equipment. While the City is still evaluating telemetry options for all the stations, it is important to note that most of the larger stations already have a telephone dialer with battery backup to immediately alert operations personnel of problems.

We will continue to upgrade systems as capital funds allow. If you have questions or need additional information, feel free to contact me at 865-7258 or sroy@ci.burlington.vt.us

Sincerely,

A handwritten signature in black ink, appearing to read 'Steve Roy', with a stylized flourish at the end.

Steve Roy, P.E.
Project Engineer

Cc: Laurie Adams, Steve Foster

Steve Goodkind, P.E.
PUBLIC WORKS DIRECTOR



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December 23, 2004

Dennis Bryer, P.E.
Environmental Engineer
VTDEC – Wastewater Management
103 South Main St., The Sewing Building
Waterbury, VT 05671-0405

Re: Electric Power Failure Plan for Riverside (East) Plant, Permit 3-1247

Dear Mr. Bryer,

This letter is the City's response to an updated Electric Power Failure Plan (EPFP) as required in Section H of East plant's latest discharge permit.

Treatment Plant

East plant has a 350 KW generator on-site that is capable of handling the entire electrical load of the plant. This generator is maintained as required and is exercised weekly to ensure proper operation.

While this facility doesn't have a specific alarm for a power outage, battery-backed alarms would go out for operational failure of key pieces of equipment if either the generator failed or the equipment failed to restart. We feel that these alarms are more useful than a general AC power failure alarm that becomes a nuisance when the generator is operating properly.

Pump Stations

There are a total of four (4) municipal pump stations located in the East plant collection system. A table on the next page lists these stations along with pertinent information. The flowrates are derived from hour meter readings along with the last pump rate information. Peak spring flows are the highest readings from the March through May time period. Using hour meters to calculate pump station flows has its advantages and disadvantages. Some of the advantages are its availability in all pump stations and its better reliability over current wastewater flow meter technology. However one of its disadvantages is that it cannot determine flow or pump problems and will yield unusually high hour meter readings when pumps run longer than normal due to

hydraulic issues or trip out due to electrical problems. Therefore, one must review the hour meter data and potentially discount single data points that are grossly inconsistent with surrounding data. The methodology used in this report involved a series of tests, which were:

1. Comparing individual pump hour meter readings to each other plus to dates before and after the data in question.
2. Comparing one pump's runtime hours to its alternate. If they were grossly different, then chances are good that a given pump had hydraulic or electrical problems.
3. Performing a statistical analysis on the data. If the flowrate in question was beyond three standard deviations of the entire data set, then this data was considered erroneous.

Pump Station	Design Average GPD	Design Peak GPD	Annual Average GPD	Spring Peak GPD	Avail. Storage GALS	Min. Storage Time HRS	Longest Outage HRS	COMMENTS
Chase Street	45,450	145,440	1,686	2,700	1,300	7.7	2.25	Storage time less than last reporting period of 10 hrs.
Fletcher Place	8,914	37,440	3,751	10,737	2,800	4.2	1.4	Storage time similar to last reporting period of 4.3 hrs.
McNeil Station	89,325	285,840	2,733	9,990	5,900	9.5	2.25	Storage time greater than 4.3 hrs last period.
Mill Street	41,625	133,200	8,105	13,835	2,680	3.1	2.25	Storage time greater than 1.4 hrs last period.

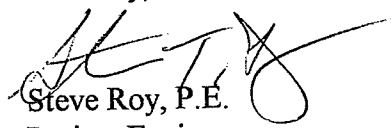
Here are our observations from the above table:

- Chase Street, McNeil and Mill Street were all affected by the same power outage. In the event of a similar outage, Mill Street is the station that needs first response.
- The above chart shows a rapid response from Burlington Electric in correction of power outages.

As in previous power failure plans, it has been estimated that depending on the time of day it may take up to 1.5 hours for pump station personnel to respond to power failures. This includes receiving the callout, travel to the station, troubleshooting, and round trip travel from the station to the plant to retrieve necessary equipment. While the City is still evaluating telemetry options for all the stations, it is important to note that most of the larger stations already have a telephone dialer with battery backup to immediately alert operations personnel of problems.

We will continue to upgrade systems as capital funds allow. If you have questions or need additional information, feel free to contact me at 865-7258 or sroy@ci.burlington.vt.us

Sincerely,


Steve Roy, P.E.
Project Engineer

Cc: Laurie Adams, Gary Greenwood

The City of Burlington
Public Works Department
Wastewater Division

Emergency Response Plan

**System Identifier: City of Burlington Public Works Department, Wastewater
Division**
July 10, 2007

1	Introduction	1
1.1	Purpose	1
1.2	Goals	1
1.3	Access Control.....	1
1.4	ERP Organization	2
2	General Emergency Planning Information	3
2.1	Planning Partnerships.....	3
2.2	Mutual Aid Agreements.....	3
2.3	Relationship Between ERP and Other Plans	4
3	Emergency Response Plan – Core Elements	5
3.1	System Specific Information.....	5
3.1.1	System Names, Owners and Administrative Contract Information .	5
3.1.2	Population Served and Service Connections.....	6
3.1.3	General Description of the Wastewater System.....	6
3.1.4	Critical System Components.....	9
3.2	Roles and Responsibilities	11
3.2.1	Incident Command System.....	11
3.2.2	Wastewater System Structure for Incident Command	12
3.3	Communications Procedures.....	13
3.3.1	Role of the Information Officer (IO).....	13
3.3.2	Internal Notification	13
3.3.3	External Notification.....	15
3.3.4	Critical Customer Notification.....	16
3.3.5	Public / Media Notification.....	17
3.4	Personnel Safety.....	18
3.4.1	Evacuation and Shelter Planning	18
3.4.1.1	Initial Evaluation	18
3.4.1.2	Evacuation Procedures.....	18
3.4.1.3	Shelter Procedures	19
3.4.1.4	Personnel Accountability	20
3.4.2	Off-Site Protective Actions	20
3.4.3	First Aid and Emergency Medical Treatment	21
3.5	Emergency Storage and Disposal Provisions for Contaminated Wastewater and Biosolids	22
3.6	Agreements with Other Wastewater Systems.....	23
3.7	Equipment and Chemical Supplies	23
3.7.1	Emergency Equipment List.....	23
3.7.2	Personnel Protective and Other emergency Equipment	24
3.7.3	Telephone Equipment.....	24
3.7.4	VHF Radio Communications.....	24
3.8	Property Protection	25
3.9	Response Capabilities	25
3.10	Sampling and Monitoring	25
4	Decision Process and ERP Activation.....	27
4.1	Threat Warning	27

4.2	ERP Activation	27
4.3	Emergency Operations Center	28
4.3.1	Wastewater System Emergency Operations Center	28
4.3.2	Local Government EOC	29
5	Emergency Response, Recovery and Termination	31
5.1	Response Phase	31
5.1.1	Initial Response	31
5.1.2	Damage Assessment	31
5.2	Recovery Phase	32
5.2.1	Recovery Planning	32
5.2.2	Recovery Actions	33
5.3	Termination and Review Phase	34
6	Action Plans	35
6.1	Man-Made Threats	35
6.2	Natural Disasters	35
7	Emergency Plan Approval, Update and Training	36
7.1	Plan Review, Approval and Update	36
7.2	Assessment of ERP Effectiveness	36
7.3	Training, Exercises and Drills	37
8	Additional Resources	38
	Appendix 0 - Action Plans AP-WW-100-107	40-51
	Appendix 1 - Wastewater Sample News Release - Known Contaminant	52
	Appendix 2 - Wastewater Sample News Release - Sewer Main Break	53
	Appendix 3 - Wastewater Sample News Release - Untreated Sewage Discharge	54
	Appendix 4 - Wastewater IT Incident Response and Reporting Checklist ..	55
	Appendix 5 - Wastewater Shut Down Table and Instructions	59

1 Introduction

This section presents the purpose, goals, requirements, access control policy, and plan overview of the Emergency Response Plan, ERP, for The City of Burlington Public Works Department, Wastewater Division. *Note that the ERP Activation process is described in Section 4.0.*

1.1 Purpose

The purpose of this ERP is to provide Burlington Wastewater with a standardized response and recovery protocol to prevent, minimize, and mitigate injury and damage resulting from emergencies or disasters of man-made or natural origin.

The ERP also describes how Burlington Wastewater will respond to potential threats identified in the Vulnerability Assessment (VA), as well as additional emergency response situations. Included in this ERP are specific Action Plans (APs) that will be utilized to respond to events and incidents.

1.2 Goals

The goals of this Emergency Response Plan (ERP) are to document and understand the steps needed to:

- Rapidly restore wastewater service after an emergency.
- Minimize wastewater system damage.
- Minimize impact and loss to customers.
- Minimize negative impacts on public health and employee safety.

- Minimize adverse effects on the environment.
- Provide emergency public information concerning customer service.
- Provide wastewater system information for first responders and other outside agencies.
- Ensure effective communication between all those involved in an emergency.

1.3 Access Control

Because of the sensitive nature of the information contained in this ERP, an access control protocol has been established under the direction of the Burlington Wastewater Public Works Assistant Director. Distribution of the ERP is limited to those individuals directly involved in Burlington Wastewater's emergency planning and response activities. The ERP copies are numbered prior to distribution, and recipients are required to sign and date a statement that includes their ERP number and their agreement not to reproduce the ERP without permission from the Burlington Wastewater Public Works Assistant Director. A secure copy of the ERP is maintained in an off-premises location, known to Burlington Wastewater's Public Works Assistant Director, in the event that the wastewater system's copies cannot be accessed.

1.4 ERP Organization

This ERP is organized into eight sections plus appendices, as described below:

Section 1: Introduction: Describes the purpose, goals, regulatory requirements, access control protocol and overall organization of the ERP.

Section 2: General Emergency Planning Information: Describes Burlington Wastewater's emergency planning partnerships, mutual aid agreements with others in the community, and the relationship between the ERP and Burlington Wastewater's other emergency response policies, procedures and documents.

Section 3: Emergency Response Plan - Core Elements: Provides specific information about Burlington Wastewater's wastewater system, presents emergency response roles and responsibilities and chain-of-command information, and describes Burlington Wastewater's communication procedures, personnel safety provisions, and emergency wastewater storage and disposal provisions. This section also provides information and procedures regarding emergency equipment and chemical supplies, property protection, and sampling and monitoring.

Section 4: Decision Process and ERP Activation: Explains how threats may be received into the wastewater system as well as what steps to take in order to activate the Emergency Response Plan (ERP) and/or the Emergency Operations Center (EOC).

Section 5: Emergency Response, Restoration and Recovery: Describes the three phases of an emergency: response, recovery and termination. General actions and guidance is provided for each phase, and these procedures will be used in conjunction with incident specific Action Plans.

Section 6: Action Plans: This section presents a summary of the incident specific Action Plans (APs) that Burlington Wastewater has created to respond to and recover from the threats that have been categorized as high risk in the VA. APs are also included for certain types of natural disasters and significant events that Burlington Wastewater may encounter.

Section 7: Emergency Plan Approval, Update, Training, and Exercises: Describes the ERP review, approval and update process, discusses evaluation of the effectiveness of the ERP, and provides information on Burlington Wastewater's ERP training program.

Section 8: Additional Resources: Provides references and web links to additional emergency planning information for wastewater systems.

Appendices: Contains specific Action Plans, forms, worksheets, press releases, and other information that will be used by Burlington Wastewater to respond to emergencies.

2 General Emergency Planning Information

This section presents the Burlington Wastewater planning partnerships and discusses the relationship between this ERP and other Burlington Wastewater related plans.

2.1 Planning Partnerships

Burlington Wastewater has established emergency planning partnerships with other parties who have agreed to help the utility in an emergency situation. A list of these agencies and a brief description of their emergency capabilities is provided below.

Agency	Capability
Burlington Police Department	Able to respond to physical threats, break-ins, vandalism, etc.
Vermont State Health Lab	Laboratory, water or wastewater may be analyzed for any number of parameters.
State of Vermont ANR Wastewater Management	Technical support, advice and/or guidance. State regulatory agency for wastewater.
Endyne Laboratory Aquatec Laboratory Main Plant Laboratory Burlington Public Works Water Treatment Facility	Between these laboratories, water or wastewater may be analyzed for any number of parameters from bacteria to toxicity.
City of Burlington Fire Department	1) Fire Department Capabilities 2) Emergency Medical Technician 3) Paramedic Unit 4) Bomb Squad Unit 5) HAZMAT capabilities, Confined Space Entry

In the event of an attack on the wastewater system, some or all of these agencies, as well as other state and federal agencies, may be called upon for assistance. A complete list of emergency response agencies with their telephone contact numbers is provided in Section 3.3.

2.2 Mutual Aid Agreements

In addition to the partnerships outlined above, Burlington Wastewater has established mutual aid agreements with the following organizations:

Organization	Nature of Agreement
South Burlington Wastewater	Contact Steve Crosby @ 658-7964 for assistance with Vactor truck or tanker trucks.
City of Burlington IT	Call Pat Schmitz for IT problems 5-7017. Call Al Stier for SCADA problems @ 658-5327.
Winooski Wastewater	Contact Eric Bailey @ 655-6421
Essex Jct. Wastewater	Contact Jim Jutras @ 878-6944
Champlain Water District	Contact Jim Fay @ 864-7454
City of Burlington Water Department	Contact Tom Dion @ 863-4501

2.3 Relationship Between ERP and Other Plans

This Emergency Response Plan (ERP) is intended to assist Burlington Wastewater's managers and staff in responding to emergencies and malevolent acts (i.e., attacks) that affect the wastewater system. The ERP is supplemented and referenced by the plans, procedures, policies and agreements shown in the table below.

Document	Relationship to ERP
Material Safety Data Sheets (MSDS)	These are standard data sheets that may contain information regarding responses to specific chemical releases as well as a host of other useful information. Employees keep all pertinent MSDS's at each Wastewater facility for easy access.
Chain of Custody Form	This document ensures that samples are protected and properly handled so as to preclude contamination from the sampling process. Used when samples are collected by one individual but tested by another individual or laboratory.
City of Burlington Safety Manual	This document is meant for the safe day to day operations of all city employees and should cover most situations that arise or refer the employee to the ERP.

3 Emergency Response Plan – Core Elements

This section presents the core elements of the Burlington Wastewater ERP, including the system specific information, roles and responsibilities in an emergency, communication procedures, personnel safety, identification of emergency storage and treatment provisions for contaminated wastewater, interconnects and agreements with other utilities, emergency equipment and supplies, property protection, response capabilities, and sampling and monitoring provisions.

3.1 System Specific Information

This section contains the Burlington Wastewater system names and system owners, administrative contact information, population served and service connections, and general description of the wastewater system.

3.1.1 System Names, Owners and Administrative Contract Information

Burlington Wastewater owns and operates 3 wastewater Treatment Plants, and 24 pump stations. The collection system is maintained by the Public Works, Right of Way Division. The system names, system owner(s), and emergency contacts with phone numbers are shown below.

System Name	System ID or Permit No.	Contact Information (Regular Business Hours)	Contact Information (Emergency or After Hours)
Burlington Wastewater Division		Laurie Adams	Office: 863-4501 Cell: 343-0325 Home: 893-1668
Burlington East Wastewater Facility	3-1247	Gary Greenwood	Office: (802)863-4878 Cell: (802)343-0326 Pager: (802)351-6241 Home: (802)893-6820 Fax (802)865-7268
Burlington Main Wastewater Facility	3-1331	Tim Grover	Office: (802)862-6565 Cell: (802)249-6461 Pager: (802)351-3986 (802)351-2453 Home: (802)434-4180 Fax (802)864-7653
Burlington North Wastewater Facility	3-1245	Tim Grover	Office: (802)862-6565 Cell: (802)249-6461 Pager: (802)351-3986 (802)351-2453 Home: (802)434-4180 Fax (802)864-7653
Burlington Wastewater Lift Stations	None	Gary Greenwood	Office: (802)863-4878 Cell: (802)343-0326 Pager: (802)351-6241 Home: (802)893-6820 Fax (802)865-7268

Burlington Public Works Collection System	None	Bill Paquette	Office: (802)863-9094 Cell: (802)316-6040 Pager: Home: 863-4948 Fax: 863-0466
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3.1.2 Population Served and Service Connections

Burlington Wastewater has identified the number of people served and number of service connections so as to assist emergency responders determine the scope of the affected area.

System Name	Population Served	Service Connections
Burlington Public Works Wastewater Division	38,889 from 2000 Census	Approximately 10,000

3.1.3 General Description of the Wastewater System

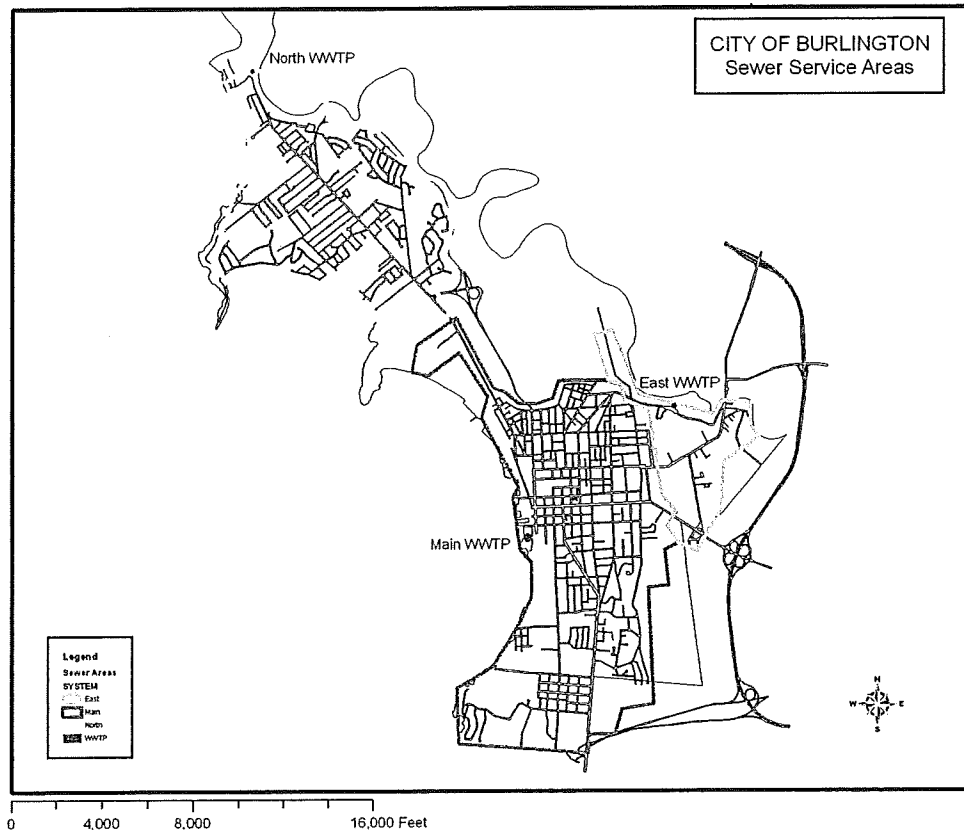
[Burlington public wastewater service includes:

Burlington has 3 treatment facilities with a combined average daily capacity of 8.5 MGD. All three plants were last upgraded to advanced secondary treatment in the early 1990s. The collection system. Is comprised of approximately 53 miles of sanitary sewers (including 4 miles of force mains), 51 miles of combined sewers and 40 miles of storm pipes. The north end of the system had a lot of separation work done just prior to the plant upgrades. The combined sewer pipes in these areas were found to be in good condition, therefore the City opted to install new and larger stormwater lines while retaining the existing pipes for sanitary flow. The Main WWTF upgrade included a vortex solids separator to treat the large volumes of stormwater associated with the combined sewer system.

The entire system has 24 wastewater pumping stations ranging in age of construction from 1962 to 2004.

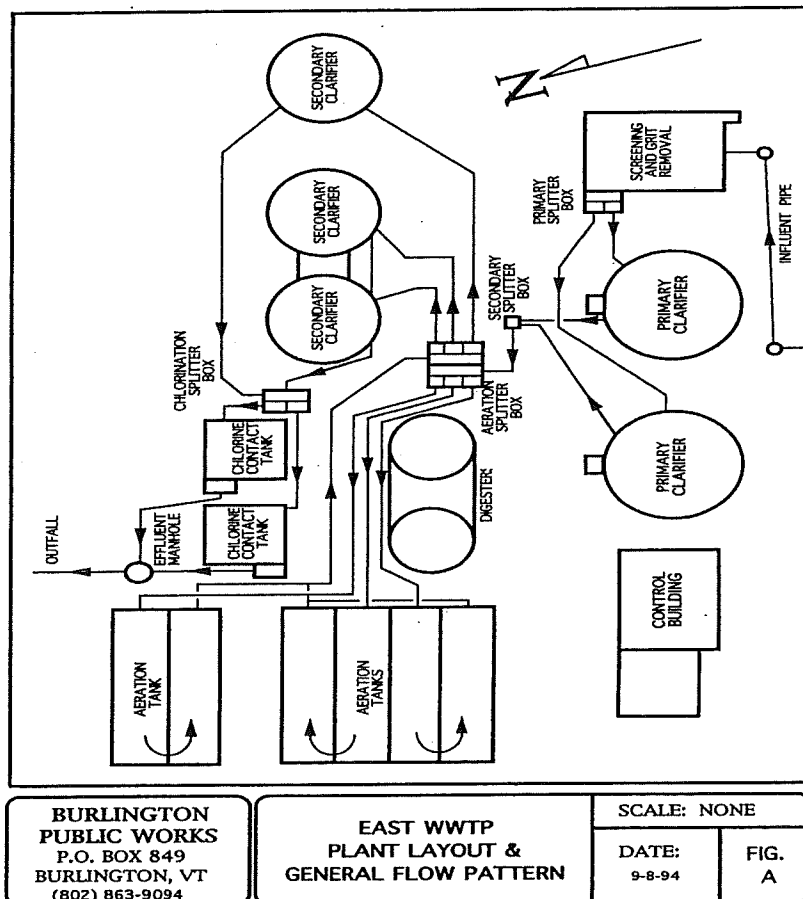
a) Collection System Map

A map of the Burlington Wastewater collection system is provided below for reference.



b) Overall Process Flow Diagrams

A map of the overall process flow through the utility is provided below for reference.



c) Site Plans and Facility “As-Built” Engineering Drawings

Site plans and engineering drawings are kept at each individual treatment facility.

d) System Description, Schematics, and Operating Procedures

Standard operating procedures and system descriptions are kept at each individual treatment facility.

e) SCADA System / Process Control Systems Operations

At this time only the Main Plant has a SCADA system. Technical information is kept at the Main Plant and contact information is listed in section 3.3.3 of this document.

3.1.4 Critical System Components

Asset	Location	Description
Main Wastewater Plant, Burlington, Vermont	53 LaValley Lane	Main Plant is a 5.3 MGD facility
North Wastewater Plant	3000 North Avenue	North Plant is a 2.0 MGD facility
Belt Filter Press	Physical >> Main Wastewater Plant Burlington, Vermont >> Control Building >> Belt Filter Press	This is the area where sludge is pressed for the three plants and outside towns. Dewatered sludge is loaded into tractor-trailers for transport to landfill.
Pump Stations	Physical >> Collection System >> Pump Stations >>	There are 25 pump stations in the wastewater collection system. All stations are alarmed and 12 have phone dialers. They include College St., South Cove Rd., Queen City, Fletcher Place, Chase St., Mill St., Crescent Beach, Leddy Park, Lakeside Ave., North Beach Upper, North Beach Lower, Flynn Ave., Van Patten Pkwy., Pine St., Appletree Point, Birch Ct., Brook Drive, Lori Lane, McNeil Generating Station, Burlington High School, Lake St., Perkins Pier, Proctor Place, Penny Lane, Landfill (pumping groundwater)
Collection System	See section 3.1.3 a) for the collection system map	The Collection System consists of 49.4 miles of sewer only, 49.7 miles of combined sewer and storm. The 41 miles of storm only are not covered under this plan.
Primary & Secondary Digesters	North & Riverside Wastewater Plants >> Primary & Secondary Digesters	Completion date for this rehabilitation was 8-31-06. Both digesters were rehabbed including new mixing technology and heat systems.
Control Building	Physical >> Main Wastewater Plant Burlington, Vermont >> North Wastewater Plant >> Control Building	
Aeration Basins	Physical >> Main Wastewater Plant Burlington, Vermont >> Aeration Basins	Contains 6 aeration cells. Biologically treats the wastewater. Have a re-aeration cell, a BNR cell mixed with a mechanical mixer and 4 aerobic cells. The re-aeration cell mixes with the primary effluent then enters the BNR cell through the primary eff.

Asset	Location	Description
		gates. The mixed liquor then flows through cell 2, 3, 6, then 5 and discharges over a rectangular weir to the effluent trough. Alum is added at the discharge channel for removal of phosphorus. The flow then leaves the aeration tanks through 4 rising stem gate valves to the secondary clarifiers. There is a non-rising stem mud valve in each tank for dewatering. The dewatering lines are connected to the RAS line from secondary clarifier #1. #1 RAS pump is used to dewater tanks. Each tank is separated by a series of rising stem gate valves. Cells # 4 and 1 have coarse bubble air diffusers with mechanical mixers and cells # 2,3,6,5 have sanitaire fine bubble stone diffusers.
Electrical MCC room/Generator	East & North Plants	Each generator powers the entire plant and is automatically exercised weekly.
Chemical Storage Tanks	Physical >> Main Wastewater Plant Burlington, Vermont >> North Wastewater Plant >> Control Building >> Chemical Storage Tanks	Alum, Chlorine, Polymer, Bromine are all stored and received at the control building. On-site operator oversees receipt of unloading.
Riverside Avenue Wastewater Treatment Plant	267 ½ Riverside Avenue	East Plant is a 1.2 MGD plant.
Fuel storage	Physical >> Main Wastewater Plant Burlington, Vermont >> Site >> Fuel storage	5,000 gallons of #2/diesel fuel.
Biological Treatment	Physical >> Main Wastewater Plant Burlington, Vermont >> Riverside Avenue Wastewater Treatment Plant >> Biological Treatment >>	Diffused air aeration tanks (3)
IT/Telecom	Physical >> Main Wastewater Plant Burlington, Vermont >> Site >> Administrative Building	Network through City. SCADA off network.
Biosolids Management System	Physical >> Main Wastewater Plant Burlington, Vermont	Main Plant belt press processes all sludge for the three Burlington WW Plants.
Electrical/Generator	Physical >> Main Wastewater Plant Burlington, Vermont >>	Main electrical feed to plant, includes generator that automatically switches over.

Asset	Location	Description
Chemical Storage	Physical >> Main Wastewater Plant Burlington, Vermont >> Riverside Avenue Wastewater Treatment Plant >> Disinfection (Chlorination, UV) >> Chemical Storage	1600-gallon storage tank in building.
Headworks Area, Preliminary Treatment	Physical >> Main Wastewater Plant Burlington, Vermont >> Riverside Avenue Wastewater Treatment Plant >> Headworks Area, Preliminary Treatment >>	Raw sewage influent and grit and rag removal

3.2 Roles and Responsibilities

This section contains the Incident Command System primary position descriptions and assignments, and Burlington Wastewater's Incident Command Structure.

3.2.1 Incident Command System

Burlington Wastewater uses the Incident Command System (ICS) for its command structure during wastewater emergencies. The table below describes the ICS command structure positions and shows which individuals will most likely hold the various positions during an emergency.

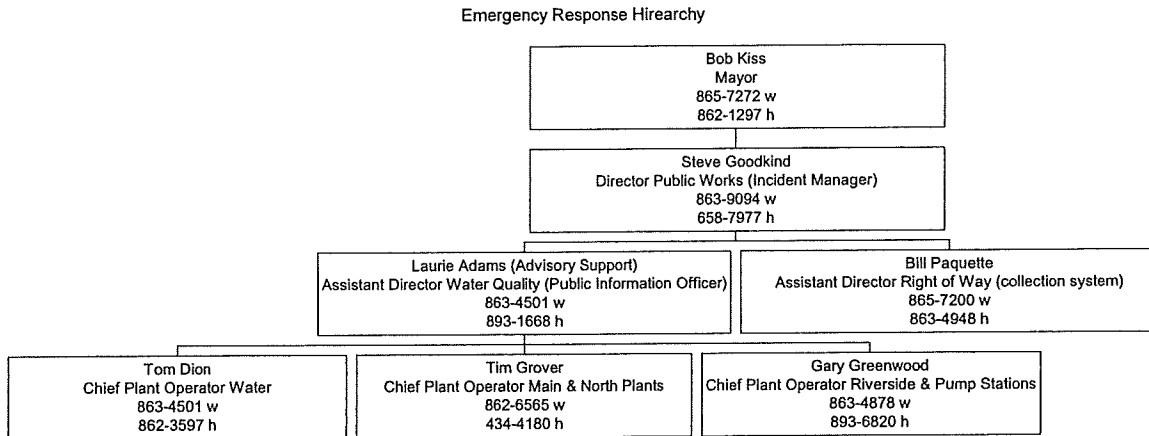
Chain of command – lines of authority

Name and title	Responsibilities during an emergency	Contact numbers
Burlington Wastewater System Laurie Adams, Assistant Director DPW	Responsible for overall operation, management and decision making for the wastewater system. The Assistant Director DPW is the lead for emergency response management, providing information to regulatory agencies, the public and news media (all communications to external parties). The Emergency Response Lead may delegate responsibility for handling water system emergencies to another person (e.g. Chief Operator who has specific expertise and training in emergency response).	Phone: (802) 863-4501 Home: (802) 893-1668 Cell: (802) 343-0325 FAX. (802) 864-8233 E-mail. ladams@ci.burlington.vt.us
Tim Grover Chief Plant Operator Main & North Plants	In charge of running Main & North wastewater treatment plants, performing inspections, maintenance and sampling and relaying critical information, assessing facilities, and providing recommendations to the wastewater system operator or manager.	Phone: (802) 862-6565 Home: (802) 434-4180 Cell: (802) 249-6461 FAX. (802) 864-7653 Press Room 865-7261 E-mail. tgrover@ci.burlington.vt.us

Name and title	Responsibilities during an emergency	Contact numbers
Gary Greenwood Chief Operator East Plant & Pump Stations	In charge of running East or Riverside wastewater treatment plant and all pump stations, performing inspections, maintenance and sampling and relaying critical information, assessing facilities, and providing recommendations to the wastewater system operator or manager.	Phone: (802) 863-4878 Home: (802) 893-6820 Cell: (802) FAX: (802) 865-7268 E-mail. ggreenwood@ci.burlington.vt.us
Plant Operators <u>Main Plant</u> Steve Perron Steve Danyow Gary Holmes Mike Swindell Jim Fitzpatrick Matt Dow <u>North Plant</u> Larry Hammond Tom Leggett <u>East Plant & Pump Stations</u> Terry Goodrich Marc Medlar <u>East Plant</u> Michael Heelan	Follow emergency procedures outlined in the "Emergency Response Plan" (ERP) to isolate and correct the problem or shut down the plant, reservoir or high tanks until the problem is resolved. Assess problem and determine if it can be handled without further assistance. If outside assistance is needed, can the mechanic or CPO solve the problem. If not follow the "Chain of Command" listed in the ERP. Answer questions in a polite manner and refer them to a department spokesperson if appropriate.	Phone: <u>Main Plant</u> 862-6404 Pagers 351-3986 or 351-2453 S. Perron 527-0304 S. Danyow 893-6802 G. Holmes 879-7554 M. Swindell 453-7675 J. Fitzpatrick 864-2243 M. Dow 524-6944 <u>North Plant</u> 862-7164 L. Hammond 658-4669 T. Leggett 893-6206 <u>East Plant</u> 863-4878 <u>Stations</u> 343-0326 T. Goodrich 527-7170 M. Medlar 872-7873 M. Heelan 658-3592
Steve Roy Public Works Engineer	Responsible for providing engineering support to the Assistant Director and Chief Plant Operators.	Phone: (802) 865-7258 Home: (802) 878-9018 Cell: (802) 343-0125 FAX: (802) 864-7653 E-mail: sroy@ci.burlington.vt.us
Steven Goodkind Director of Public Works	Overall responsibility for the entire system. Reports to Mayor.	Phone: (802) 863-9094 Home: (802) 658-7977 Cell: (802) 316-6045 FAX: (802) 863-0466 E-mail. sgoodkind@ci.burlington.vt.us

3.2.2 Wastewater System Structure for Incident Command

Burlington Wastewater uses the Incident Command System (ICS) for its command structure during wastewater emergencies. The table below describes the ICS command structure positions and shows which individuals will most likely hold the various positions during an emergency.



3.3 Communications Procedures

In general, communications during an emergency response will proceed along the chain of command of the ICS. The number of people notified will increase as the incident expands and decrease as the incident contracts toward its conclusion.

The type and extent of the disaster will dictate the normal and / or alternative methods of communication that will be used. The possibility of a coordinated attack that targets the water, wastewater, power, and communications systems must be considered. In this case, it would be reasonable to assume that some methods of communication will either be unavailable or limited to certain areas during an emergency. It is anticipated that employees will know upon arrival at their duty stations which communication systems are functional and which are not. This information should be relayed to the Burlington Wastewater Assistant Director upon discovery.

3.3.1 Role of the Information Officer (IO)

Burlington Wastewater has selected the Assistant Director of Water Quality to serve as the IO during an event. This person is responsible for distribution of information to the appropriate media.

3.3.2 Internal Notification

The exact persons notified will be at the discretion of the Public Works Assistant Director with interaction from the Public Works Director.

The individual(s) who discover the threat or emergency situation will immediately notify Burlington Wastewater's 24-hour Call Center, or currently Homes Security. The dispatcher at the Call Center will then notify the appropriate Chief Operator or Assistant Director. The remainder of the Burlington Wastewater emergency response staff will be notified as required.

The following contact information represents the network of Burlington Wastewater personnel, and serves as the primary list of contact information for internal staff.

Name and title	Responsibilities during an emergency	Contact numbers
Burlington Wastewater System Laurie Adams, Assistant Director DPW	Responsible for overall operation, management and decision making for the wastewater system. The Assistant Director DPW is the lead for emergency response management, providing information to regulatory agencies, the public and news media (all communications to external parties). The Emergency Response Lead may delegate responsibility for handling water system emergencies to another person (e.g. Chief Operator who has specific expertise and training in emergency response).	Phone: (802) 863-4501 Home: (802) 893-1668 Cell: (802) 343-0325 FAX. (802) 864-8233 E-mail. ladams@ci.burlington.vt.us
Tim Grover Chief Plant Operator Main & North Plants	In charge of running Main & North wastewater treatment plants, performing inspections, maintenance and sampling and relaying critical information, assessing facilities, and providing recommendations to the wastewater system operator or manager.	Phone: (802) 862-6565 Home: (802) 434-4180 Cell: (802) 249-6461 FAX. (802) 864-7653 Press Room 865-7261 E-mail. tgrover@ci.burlington.vt.us
Gary Greenwood Chief Operator East Plant & Pump Stations	In charge of running East or Riverside wastewater treatment plant and all pump stations, performing inspections, maintenance and sampling and relaying critical information, assessing facilities, and providing recommendations to the wastewater system operator or manager.	Phone: (802) 863-4878 Home: (802) 893-6820 Cell: (802) FAX. (802) 865-7268 E-mail. ggreenwood@ci.burlington.vt.us
Plant Operators <u>Main Plant</u> Steve Perron Steve Danyow Gary Holmes Mike Swindell Jim Fitzpatrick Matt Dow <u>North Plant</u> Larry Hammond Tom Leggett <u>East Plant & Pump Stations</u> Terry Goodrich Marc Medlar <u>East Plant</u> Michael Heelan	Follow emergency procedures outlined in the "Emergency Response Plan" (ERP) to isolate and correct the problem. Assess problem and determine if it can be handled without further assistance. If outside assistance is needed, can the mechanic or CPO solve the problem. If not follow the "Chain of Command" listed in the ERP. Answer questions in a polite manner and refer them to a department spokesperson if appropriate.	Phone: <u>Main Plant</u> 862-6404 Pagers 351-3986 or 351-2453 S. Perron 527-0304 S. Danyow 893-6802 G. Holmes 879-7554 M. Swindell 453-7675 J. Fitzpatrick 864-2243 M. Dow 524-6944 <u>North Plant</u> 862-7164 L. Hammond 658-4669 T. Leggett 893-6206 <u>East Plant</u> 863-4878 <u>Stations</u> 343-0326 T. Goodrich 527-7170 M. Medlar 872-7873 M. Heelan 658-3592

Steve Roy Public Works Engineer	Responsible for providing engineering support to the Assistant Director and Chief Plant Operators.	Phone: (802) 865-7258 Home: (802) 878-9018 Cell: (802) 343-0125 FAX: (802) 864-7653 E-mail. sroy@ci.burlington.vt.us
Steven Goodkind Director of Public Works	Overall responsibility for the entire system. Reports to Mayor.	Phone: (802) 863-9094 Home: (802) 658-7977 Cell: (802) 316-6045 FAX: (802) 863-0466 E-mail. sgoodkind@ci.burlington.vt.us
Bill Paquette	Responsible for Right of Way group that includes 16 staff. Maintenance of the Collection System is one of their duties.	Phone: (802) 865-7200 Home: (802) 863-4948 Cell: (802) 316-6040 FAX: (802) 863-0466 E-mail. wpayette@ci.burlington.vt.us

3.3.3 External Notification

The table below contains contact information for the local and national agencies that Burlington Wastewater may need to notify. The Director will make the decision as to which of these agencies needs to be notified, and at what point in the threat evaluation the calls should be made. The Assistant Director or Director will serve as the wastewater system point of contact for these agencies.

WASTEWATER SYSTEM EMERGENCY CONTACT LIST		
South Burlington Wastewater – Mutual Aid	Steve Crosby	658-7964
Winooski – Mutual Aid	Erik Bailey	655-6421
Essex Junction – Mutual Aid	Jim Jutras	878-6944
Home Security	Alarms at all three plants and five stations, Proctor Place, Flynn Ave., South Cove, Crescent Beach, Upper North Beach (High School when station rebuilt)	800-933-4762 or 253-2141 fax 253-2143
Omega Electric (Jasmine)	Station Alarms for 4 College St., 260 Lake St., 4	862-0517 ext 236

	Maple St., 1160 Pine St., 1 Institute Rd., 25 Mills St., 131 Appletree Pt.	cell 373-1114 pager 351-8001
Hallam (for SCADA MP)	Al Stier	658-4891 fax 658-5327 pager 351-4865
Vermont Emergency Mgmt.		802-244-8721 or 800-347-0488
Burlington Police	Chief Mike Schirling	658-2704 (ext. 191)
Burlington Fire	Chief Michael O'Neil	864-4553 (ext. 10)
UVM Police	Chief Gary Margolis	656-3473 or 656-2027
City Health & Safety	Steven Goodkind	863-9094 cell 343-0326
State of VT ANR	Brian Kooiker	802-241-3822
Wastewater Management	Dennis Bryer	802-241-3735
State Health Lab	Mary Celotti	863-7570
VT Hazardous Materials	Hotline	800-641-5005
Mayor	Bob Kiss	865-7272 (w) 862-1297 (h)
City Attorney	Ken Schatz	865-7121
FBI	Albany Regional Office	518-456-7551
Champlain Water District	Jim Fay	864-7454
Endyne (lab)	Williston	879-4333
Severn Trent (lab)	Colchester	655-1203
Aquatec	Williston	860-1638
M & K Commercial Diving	Dave Hathaway	802-775-7744 (w) or pager 802-742-6255 or cell 770- 0957
Hertz First Choice Rental		872-5300
Essex Equipment		878-5316
Engineers Construction		863-6389

3.3.4 Critical Customer Notification

Large Wastewater Customers Calling Order		
UVM	Physical Plant	656-2186/656-2560
Fletcher Allen Health Care	Main #	847-0000
Northgate Apartments		658-2722
Starr Farm Nursing Center		658-6717
Burlington Housing Authority		864-0538
Wyndham Hotel		658-6500
Champlain College		860-2700
Superintendent of Schools		864-8461

3.3.5 Public / Media Notification

Effective communication with the public is a key element of this ERP. Burlington Wastewater personnel have been instructed to direct all media questions or information requests related to an emergency situation to Burlington Wastewater's Assistant Director Water Quality. The **Assistant Director** is the official spokesperson for Burlington Wastewater, and is the only Burlington Wastewater employee who is authorized to speak directly to public media representatives.

The table below provides contact information for the various media agencies that Burlington Wastewater's Assistant Director might use to disseminate information to the public.

MEDIA CONTACTS		
Radio		
WVMT (AM)	Fax 655-1329	655-1620
WJOY		658-1230
WEZF		655-0093
WIZN		860-2440
TV		
WCAX (Channel 3)	Fax 652-6399	652-6397
WPTZ (Channel 5)	Fax 655-5451	655-5588
Print		
Burlington Free Press	Fax 660-1802	865-0940

Burlington Wastewater has prepared a series of press releases for use during various emergency situations. These press releases can be found in the Appendix.

3.4 Personnel Safety

The safety of Burlington Wastewater staff, emergency responders, and the public is paramount during an emergency. This section provides basic safety information and procedures to be followed in an emergency, including a toxic or potentially toxic release of chlorine or other chemical agents from a wastewater treatment plant. Additional information regarding proper procedures during and after a chemical release can be found in Burlington Wastewater's Risk Management Plan and in the associated Action Plan. This section will cover Evacuation and Shelter Planning, Off-site Protective Actions, and Emergency First Aid Procedures.

3.4.1 Evacuation and Shelter Planning

This section discusses Burlington Wastewater's evaluation process, evacuation and shelter procedures, as well as how Burlington Wastewater will account for its employees once a decision to evacuate has been made.

3.4.1.1 Initial Evaluation

When an incident occurs at or near a location or facility that is occupied by personnel, protective actions include evacuation, sheltering-in-place and a combination of the two. The **wastewater system manager, safety director, or a supervisor** should make the decision as to which action is appropriate. As part of the decision making process, the following issues will be considered:

- If a hazardous material is involved, its characteristics, amount, release rate, physical state, ambient temperature, and location.
- The present location of the employees at risk, relative to the location of the hazardous conditions.
- The time factors involved regarding the arrival of first responders, and how quickly the emergency situation can be mitigated.
- The effect of the present and predicted meteorological conditions (wind direction and speed, storm warnings, flood stage level, etc.).

The capability to communicate with both the employees at risk and emergency response personnel before, during and after the emergency.

3.4.1.2 Evacuation Procedures

Burlington Wastewater has developed an evacuation plan for each of its facilities and operating locations. The plan designates primary and secondary evacuation routes and exits and ensure that the routes and exits are clearly marked, well lit, unobstructed at all times, and unlikely to expose evacuating personnel to additional hazards. The plan also identifies post-evacuation assembly areas and shelter locations. Staff and other personnel who frequently visit wastewater facilities are trained regularly in these evacuation procedures.

The Public Works Assistant Director will determine which areas should be evacuated, and if the evacuation areas need to be expanded as the incident progresses. If the incident results in off-site consequences (for example, a hazardous materials release), the Public Works Assistant Director shall determine evacuation requirements in conjunction with appropriate external agencies.

Decisions regarding evacuation are incident-specific, and must be made at the time of the incident. Estimated zones of impact that may be provided by Risk Management Plans or incident specific checklists should be used for planning purposes only and should not be used peremptorily in an emergency response situation.

If the decision is made to evacuate, then Burlington Wastewater will follow the guidelines shown below:

- Facility personnel will be notified of the need to evacuate using the public address or alarm system, or by person-to-person word of mouth.
- Facility evacuation will follow pre-designated evacuation routes from buildings and plant grounds.
- The evacuation routes are posted at the entrance to all buildings and within employee break areas.
- Once an evacuation is ordered, all employees will report to the pre-designated assembly areas for each facility or location, as shown on the evacuation maps, to be accounted for by their **supervisor, assembly area coordinator, other pre-designated individual**.
- Supervisors are responsible to assure their disabled employees are provided with adequate assistance during an evacuation.
- Once an area has been evacuated, the wastewater system's Public Works Assistant Director or another designated individual will secure the area to ensure that all individuals have been evacuated and that public access is restricted.
- Security personnel operating in or around an evacuated area must be cautious of hazardous or potentially hazardous conditions that would necessitate the use of personnel protective clothing or place them in an unsafe condition.

3.4.1.3 Shelter Procedures

During emergency incidents, the safest course of action may be for Burlington Wastewater personnel to remain inside their facility, or to take shelter in a building away from the wastewater systems facilities.

The Public Works Assistant Director, Chief Operator, or another designated individual will be responsible for determining whether sheltering-in-place or off-site sheltering is the most appropriate response to protect the at-risk employees. If the decision is made to shelter, then Burlington Wastewater personnel will follow the guidelines shown below.

- All doors and windows to the outside will be closed and locked, and as many internal doors as possible will be closed.
- Personnel will assemble at a pre-designated location (preferred locations are windowless rooms).
- If an outdoor explosion is possible, drapes, curtains, and shades over windows will be closed and personnel will be directed to stay away from windows to prevent potential injury from flying glass.
- Medical unit will be notified of the shelter locations and be provided with information on any injuries or the type of hazardous material and any known exposures.

3.4.1.4 Personnel Accountability

Primary and secondary emergency assembly areas have been designated for each of Burlington Wastewater's facilities as follows:

East Plant primary assembly area is the front gate.

East Plant secondary assembly area is the garage.

Main Plant primary assembly area is the administration bldg. Parking lot.

Main Plant secondary assembly area is the front gate.

North Plant primary assembly area is the front gate.

North Plant secondary assembly area is by headworks building.

Each **manager/supervisor** is responsible for head counts, assembly security and safety, and communications with the Public Works Assistant Director to obtain support for various needs, such as food, water, medical aid, or transportation.

Burlington Wastewater personnel will follow the guidelines below regarding personnel accountability.

- All designated assembly areas are indicated on the facility evacuation plans.
- All personnel are responsible to report to their designated assembly area.
- Supervisors are responsible to assure all their personnel have reported after an ordered evacuation or shelter.
- Personnel who are not accounted for at the assembly area must be reported to the Public Works Assistant Director, or another designated individual to assure that a proper response or search is coordinated. This response may include checking with other assembly areas, trying to reach the individual by radio communication, or organization of a formal search.

3.4.2 Off-Site Protective Actions

Some hazardous materials hazards have the potential to affect off-site personnel and the fire and/or police may request support from Burlington Wastewater in making protective action decisions for the general public surrounding the wastewater system facilities.

Burlington Wastewater will respond to requests from the fire and/or police for recommendations, or protective actions for the general population surrounding the facility, including information on the type of hazardous material, its characteristics, amount released, release rate, physical state, ambient temperature, and the location of the source.

3.4.3 First Aid and Emergency Medical Treatment

Burlington Wastewater personnel will follow the following first aid and medical care procedures in the event of an emergency.

- Call (911) for medical assistance
- Attempt to administer emergency first aid to injured persons, as necessary until off-site medical personnel arrive.
- ***Public Works Assistant Director will designate*** a supervisor to coordinate off-site ambulance and medical assistance.
- Follow decontamination protocol if necessary including: removing wet or exposed clothing, flushing affected skin and hair with water, and using soap or shampoo for oily substances.
- Provide post-emergency medical evaluations for all employees as required by OSHA.

3.5 Emergency Storage and Disposal Provisions for Contaminated Wastewater and Biosolids

Information on Burlington Wastewater's emergency storage, treatment and disposal options for contaminated wastewater and biosolids are presented in this section.

Location	Emergency Storage Capacity
Temporary holding, contaminated wastewater. North Plant empty aeration tank	165,000 gallons per cell, up to three cells available at any given time.

Burlington Wastewater has identified the following storage, process and disposal options for contaminated biosolids.

Level of Contamination	Storage and/or Disposal Option
Temporary holding: North Plant empty aeration tank	165,000 gallons per cell, up to three cells available at any given time.
No potential for reuse	Landfill, approval needed first. Call Moretown Landfill, Tom Badowski, 800-981-4251

3.6 Agreements with Other Wastewater Systems

There are other wastewater utilities within the regional area. These wastewater utilities have their own collection and treatment systems. Refer to section 2.2 of this ERP Report for mutual aid agreements.

3.7 Equipment and Chemical Supplies

The equipment and chemical supplies that Burlington Wastewater has assembled to respond to incidents are described in this section. In addition, the individual Action Plans for specific types of incidents contain detailed equipment requirements.

3.7.1 Emergency Equipment List

Burlington Wastewater has identified additional sources of operational equipment and repair parts in excess of normal usage that can be utilized in the event of an emergency situation. The decision regarding what type and quantity of additional equipment to have available is based on the results of the specific scenarios and critical assets identified in Burlington Wastewater's vulnerability assessment.

A list of equipment sources, including vendors, chemical suppliers, service contractors, and the equipment, materials and services that they provide is provided below.

Equipment / Supply Description	Source / Location	Specific Function & Capability	Responsible Person / Title	Telephone Number	Inventory / Restocking Frequency
Heavy Equipment:	Street Department	Backhoes, Loaders, Dump Trucks	Bill Paquette	865-7200 ofc. 316-6040 cell	
Communication Equipment:	Equip. Maintenance	Assist in obtaining extra cell phones, radios	Rob Green	864-0166	
Air Compressors	Pine St.		Bill Paquette	865-7200 ofc. 316-6040 cell	
Fans & Blowers	East Plant, Water Plant		Gary Greenwood Tom Dion	863-4878 863-4501	
Generators	East Plant – at facility & on W12. Main & North				
Pumps	Each plant has 4 " trash pumps				
Chemicals:	Suppliers	Sodium Hypochlorite	JCI Jones Chemical	800-364-2944	Main 5,400 gals North 1,300 gals

Equipment / Supply Description	Source / Location	Specific Function & Capability	Responsible Person / Title	Telephone Number	Inventory / Restocking Frequency
					East 1,500 gals
	Lorri Rice	Bromine	National Colloid	740-282-1171	Main 2,500 gals
		Alum & Ferric Chloride	Kemiron	800-654-8373 ext. 7148	Main 8,000 gals North 3,400 gals
		Sodium Aluminate	Holland	800-639-9602	East 2,500 gals.
		Polymer for Main Plant	Mannich-Atlantic	888-632-0007	Main 8,000 gals
		Polymer for East Plant	Ciba	800-322-3885	East 500 lbs.
Refer to Table 3.3.3 for additional suppliers					

3.7.2 Personnel Protective and Other emergency Equipment

Only routine PPE listed in the Burlington OSHA Compliance Manual & Accident Prevention Manual are expected to be utilized by Wastewater personnel. If there is an explosive or toxic situation, Wastewater personnel must call 911.

3.7.3 Telephone Equipment

If available, Burlington Wastewater will utilize normal methods of voice and data communication, including land-based telephones, wireless phones and SCADA during an emergency.

3.7.4 VHF Radio Communications

During an emergency, specific instructions will be provided by Burlington Wastewater's Command Center to personnel on the operation and prioritization of Utility radio facilities. It is important to note that radio communications are NOT SECURE, and therefore radios must not be used to transmit sensitive messages or data that is not ready for public release, or would give advantage to an attacker. For this reason, it is anticipated that radios will be of limited use during an attack on the wastewater system, unless there is a loss of off-site power or other event affecting the land-based and cell phone service. Information on Burlington Wastewater's radios and usage procedures is shown in the tables below.

Channel	User Group / Frequency	Type of Usage
	Wastewater / 153.935	Routine Operations and Emergency Exercises
	DPW / 151.115	Emergency Operations

3.8 Property Protection

In the event of a real or potential malevolent event, the Director will make the determination as to what wastewater system facilities should be immediately "locked down", including the implementation of specific access control procedures and the establishment of a security perimeter. The possibility of secondary malevolent events will be considered, given that the initial act may be diversionary.

Burlington Wastewater personnel involved in an emergency response will take all necessary measures to protect potential evidence for law enforcement, should the event be declared a crime scene.

Additional property protection measures that Burlington Wastewater may take include cancellation of facility tours and establishment of a security perimeter around the facility or incident site.

3.9 Response Capabilities

Response CM Class / Type	CM Title	CM Description
Response / Policies and Procedures	Emergency Operating Procedures	A set of procedures that define employee responses to specific types of emergency events.
Response / Policies and Procedures	Coordination with Local Police Force	An agreement with local law enforcement units regarding the support the utility can expect from the agency and the type of training and support the utility will provide to responding police agencies.
Response >> Physical Mitigation	Alternate electric switching equipment	Utility arranges for emergency replacement or repair of electrical switching equipment in substation
Response >> Policies and Procedures	HAZMAT procedural plan	Hazardous material handling and response procedures

3.10 Sampling and Monitoring

Each CPO will have the primary responsibility for all wastewater sampling and monitoring activities during an actual or potential contamination event. The CPO will also play a key role in the interpretation of monitoring lab results, and will consult directly with the Assistant Director on significant findings.

The Main Plant laboratory has the following analytical capabilities:
E. Coli, Total P, TSS, TRC, pH, NH3-N, DO, temperature

If outside laboratory assistance is needed, Burlington Wastewater will contact the following laboratory facilities:

Outside Laboratory Name	Contact Number	Capabilities
Endyne	Regular hrs: 879-4333 After hrs:	Routine permit testing: BOD, metals, priority pollutants
Severn Trent	655-1203	Same as above
Aquatec	860-1638	Toxicity

4 Decision Process and ERP Activation

This section defines the decision process to be followed to determine if and when the ERP should be activated.

4.1 Threat Warning

The "threat warning" is the initial occurrence or discovery that triggers an evaluation of whether or not to activate the ERP. A description of the possible threat warnings that Burlington Wastewater may encounter is provided below. If any of the conditions are met, then the Public Works Assistant Director will issue a Threat Warning.

Security Breach. Physical security breaches caused by relaxed operations, such as unsecured doors or criminal acts such as trespassing are probably the most common threat warnings.

Witness Account. Employees or neighbors may see suspicious activity, such as trespassing, breaking and entering, and other types of tampering, that they report to local law enforcement or to the wastewater system.

Notification by Perpetrator. A threat may be made directly to the utility, either verbally or in writing. Historical incidents would indicate that verbal threats made over the phone are more likely than written threats.

Notification by Law Enforcement. Burlington Wastewater may receive notification about a threat directly from law enforcement. Such a threat could be a result of a report of suspicious activity or gathered by law enforcement intelligence.

Notification by News Media. A threat to damage or contaminate the wastewater system might be delivered to the news media, or the media may discover a threat. A conscientious reporter should immediately report such a threat to the police, and either the reporter or the police would immediately contact the wastewater system.

Unusual Sewage Characteristics. All unusual changes in wastewater characteristics (appearance, odor, oily sheen, visible emissions, LEL alarms, etc.) should be reported and investigated. Field staff and/or customers will probably be the first to encounter any unusual characteristics.

4.2 ERP Activation

Once the Public Works Assistant Director or his designee issues a threat warning, the threat decision process begins. The Director or designated alternate should immediately be notified since they will be involved in this decision process.

The threat decision process is considered in three successive stages: 'possible', 'credible', and 'confirmed'. As the threat escalates through these three stages, the actions that might be considered also change. The following table describes the stages, actions that will be taken, and activation of the ERP. The Director is responsible for working through the threat decision process and implementing the ERP as needed.

Decision Process Stage	Actions Taken	ERP Activation Level
Stage 1 Possible Threat	Evaluate available information Review findings from VA	Implement precautionary response actions Determine if threat is possible (could something have actually happened?)
Stage 2 Credible Threat	Determine that threat is credible by establishing corroborating information. Highly credible source Staff reports of unusual wastewater Unusual alarms or monitoring results	Activate portions of ERP Initiate internal and external notifications Consider isolation of portion of system Initiate sampling and analysis Consider partial or full activation of Burlington Wastewater EOC
Stage 3 Confirmed Major Event	Confirm threat by verifying definitive evidence and information that establishes the major event Perform sampling and analysis	Fully implement ERP Immediately initiate appropriate Action Plans (APs) Fully activate Burlington Wastewater EOC

In determining whether or not to activate the ERP, Burlington Wastewater will also consider what is going on in the rest of the community regarding threat levels or any large scale events that may affect the drainage area. Examples of events that may necessitate partial or full activation of Burlington Wastewater's ERP include the following:

- Overturned gasoline truck.
- Plane crash.
- LEL alarm at treatment plant head works.
- Notification from FBI that there is a known threat that may occur.
- Change in local or national threat level.

4.3 Emergency Operations Center

This section of the ERP discusses Burlington Wastewater's Emergency Operations Center (EOC) and how Burlington Wastewater will interact with the City of Burlington, Vermont EOC should it be determined that the City of Burlington, Vermont EOC be activated.

4.3.1 Wastewater System Emergency Operations Center

Burlington Wastewater's Emergency Operations Center (EOC) is a pre-designated facility to coordinate the overall response and support to an emergency. The primary EOC is located at the Burlington Police Station.

The EOC has sufficient communication equipment (phones, computer, two-way, etc.), copies of all engineering and operational plans and procedures, chalk or white boards and tables and chairs sufficient to meet the needs of any on-site emergency.

During an emergency situation, the EOC and its personnel will perform the following functions:

- Establish an EOC Director to manage the Operations, Planning/Intelligence, Logistics, Finance/Administration Sections, and related sub-functions.
- Set priorities and develop/execute Action Plans.
- Coordinate and support of all field level incident activities within the wastewater system service area.
- Gather, process, and report information within the wastewater service area and to other involved agencies regarding the magnitude and potential impact of the event on the community, as well as information on specific damages and planned response and recovery actions.
- Coordinate with local government, operational areas, or regional EOCs as appropriate.
- Request resources from internal and external sources.
- Provide food, water, and other emergency supplies for wastewater system operators who are not able to leave their posts during an emergency.

In the event a Credible or Confirmed Threat has been established, the Burlington Wastewater staff will notify the Public Works Assistant Director and/or Public Works Director or designated alternate. The Public Works Assistant Director or alternate should then make the decision whether or not to activate the EOC. Once the decision to activate the EOC has been made, subsequent notification to City of Burlington, Vermont should be made to notify them of the threat and the activation of the Burlington Wastewater EOC.

4.3.2 Local Government EOC

Depending on the emergency situation, the Public Works Assistant Director or designee may recommend that the City of Burlington, Vermont EOC be activated. Upon making the recommendation that the City of Burlington, Vermont EOC should be activated the Public Works Assistant Director or designee will provide immediate, specific information to the relevant agencies.

Based on the City of Burlington, Vermont emergency plan the Public Works Assistant Director may be required to report to the City of Burlington, Vermont EOC to serve as liaison during a large extended emergency. A Burlington Wastewater designated alternate is one of the two Chief Plant Operators to coordinate the activities of the EOC, as required.

Once City of Burlington, Vermont has been notified of the threat and the Burlington Wastewater EOC activation, the Burlington Wastewater EOC designee should provide immediate, specific information to the relevant agencies, and be prepared to describe

the magnitude and potential impact of the event on public health and safety. Up-dates on the actions of Burlington Wastewater as well as damages and recovery actions should be provided regularly and consistently during the event.

Any time a major incident occurs in City of Burlington, Vermont, the emergency management system as described in the City of Burlington, Vermont, Comprehensive Emergency Management Plan (CEMP) is implemented. The CEMP includes response activities such as initial damage assessment, emergency and short-term medical care, and the return of vital life-support systems to minimum operating standards.

According to the CEMP, when any City of Burlington, Vermont agency receives information about a potential emergency or disaster, it will conduct an initial assessment, determine the need to alert others, and set in motion the appropriate actions to reduce risk and potential impacts.

Emergency response activities will be conducted as described in agency policies, procedures, and instructions, and may involve activating the City of Burlington, Vermont Emergency Operations Center (EOC) for coordination and support. Specific objectives of the CEMP include:

- providing warnings and emergency public information,
- helping to save lives and property,
- supplying basic human needs,
- maintaining or restoring essential services, and
- protecting vital resources and the environment.

5 Emergency Response, Recovery and Termination

This section discusses general emergency response and recovery actions that Burlington Wastewater will take as it progresses through the different stages of an incident. It covers initial discovery and notifications, damage assessment, recovery, and incident termination.

5.1 Response Phase

This section contains general procedures for Burlington Wastewater personnel involved in initial discovery, response and damage assessment activities.

5.1.1 Initial Response

When a situation occurs that is judged to be of an emergency, "out of the ordinary", or suspicious nature, the person who first notices the situation should determine whether an immediate response by police, fire, or emergency medical services is necessary. If so, immediately call 911 to report the incident. Next, report the incident to your supervisor.

General information to be reported from Burlington Wastewater facilities (or incident sites) includes:

- What has happened?
- What can be done about it?
- What is needed?
- An assessment of whether the situation calls for activation of the Burlington Wastewater's Emergency Operations Center (EOC) and/or activation of the City of Burlington, Vermont EOC.
- The current status of Burlington Wastewater's personnel, equipment, vehicles, communications capabilities, facilities, and other resources.

The employee who first noticed the incident and the Supervisor that responded should:

- Notify the Director or the Alternate Director as soon as possible, and
- Remain in a safe location in the vicinity to meet and assist medical, fire, and police personnel and other first responders as necessary.

5.1.2 Damage Assessment

Damage assessment is used to determine the extent of damage, estimate repair or replacement costs, and identify the resources needed to return the damaged system to full operation. This assessment is accomplished during the emergency response phase of the event, before the recovery phase is implemented.

The Director is responsible for establishing a Damage Assessment Team (DAT).

The Burlington Wastewater DAT will be led by ***an operations or maintenance supervisor, with representatives from engineering and procurement.*** Team composition may vary, however, depending upon the nature and extent of the emergency.

Damage assessment procedures should follow the guidelines established for system operability checks and determination of operability/serviceability. At a minimum, the damage assessment team will complete the following activities:

- Conduct an initial analysis of the extent of damage to the system or facility.
- Estimate the repairs required to restore the system or facility; the estimate should consider supplies, equipment, rental of specialized equipment (e.g., cranes), and additional staffing needs.
- Provide the list of repairs to the procurement representative so a cost estimate to conduct the repairs can be developed.

5.2 Recovery Phase

Once the emergency has passed, attention must be paid to resuming normal activities and service. Burlington Wastewater's approach to recovery planning and activities is presented in this section.

5.2.1 Recovery Planning

During emergency response operations, the Public Works Assistant Director or Director will appoint a Recovery Manager. The Recovery Manager is responsible for selecting a recovery team and developing a recovery strategy prior to emergency termination.

The Burlington Wastewater Recovery Manager will be a senior operations representative familiar with the systems that may be affected by the emergency. He/she will have the responsibility and authority to coordinate recovery planning; authorize recovery activities; protect the health and safety of workers and the public; and initiate, change, or recommend protective actions. Additional responsibilities include the following:

- Facilitate the transition from emergency to recovery operations.
- Develop, implement, and maintain the Recovery Plan.
- Coordinate all vendor and contractor activities that occur onsite.
- Ensure that the appropriate safety inspections have been completed.
- Coordinate the completion of emergency repairs and schedule permanent repairs.
- Notify key agencies of emergency repair status and the scheduled completion of system repairs.
- Complete permanent repair and/or replacement of system facilities.
- Review press releases prior to distribution.
- Release repaired facilities and equipment for normal use.
- Replace, or authorize the replacement of materials and supplies used in the emergency.
- Document all recovery activities.

The Recovery Manager determines the expertise and selects the personnel necessary for the recovery team. In general, the composition of the recovery team is based on the nature and extent of the emergency and includes:

- Technical advisors to the Recovery Manager, which may include external experts such as industrial hygienists or fire protection specialists.
- Wastewater system personnel with the technical expertise to direct post-incident assessment activities and to analyze the results. Maintenance, operations, and engineering staff are expected to fill these positions.
- Assistant Director Water Quality to respond to inquiries or concerns from employees, the public, the news media, and outside agencies. The Assistant Director should be prepared to provide information regarding the results of the incident investigation, the extent of onsite and offsite impacts, and the status of recovery operations.

5.2.2 Recovery Actions

The following activities will be directed by the Chief Operator and will be executed by the recovery team as required following an incident or emergency situation.

- Notify all appropriate regulatory agencies that recovery phase is underway.
- Install warning signs, barriers and shielding as needed.
- Take measures to protect workers and the public from hazardous exposures.
- Complete detailed evaluations of all affected wastewater utility facilities and determine priorities for permanent repair, reconstruction, or replacement at existing or new locations.
- Begin repair activities design and make bids for contractor services.
- Make necessary repairs to the system and un-tag repaired facilities and equipment.
- Restore all telecommunications, data processing, and similar services to full operation.
- Complete assessment of losses and costs for repair and replacement, determine approximate reimbursements from insurance and other sources of financial assistance, and determine how residual costs will be financed by the wastewater utility.
- Define needs for additional staff, initiate recruitment process, and adopt temporary emergency employment policies as necessary.
- Execute agreements with vendors to meet service and supply needs.
- Address needs for handling and disposing of any hazardous waste generated during recovery activities.
- Control discharges as a result of recovery activities within regulatory and environmental compliance limits.
- Reevaluate need for maintaining the emergency management organization; consider returning to the normal organizational structure, roles, and responsibilities when feasible.

- Collect cost accounting information gathered during the emergency and prepare request for Emergency Disaster Funds (follow FEMA and State OES requirements).
- Debrief staff to enhance response and recovery efforts in the future by identifying lessons learned, developing action plans and follow-up mechanisms, and providing employee assistance programs if needed.
- Prepare After-Action Reports as required.

5.3 Termination and Review Phase

The Recovery Manager will officially terminate the recovery phase when normal operations are resumed at all facilities affected by the emergency. Termination and review actions include the following:

- Initiate permanent reconstruction of damaged wastewater system facilities and systems.
- Obtain inspections and/or certifications that may be required before facilities can be returned to service.
- Restore wastewater system operations and services to full pre-event levels.
- Determine how emergency equipment and consumable materials should be replenished, decontaminated, repaired or replaced.
- Identify operational changes that have occurred as a result of repair, restoration, or incident investigation.
- Document the recovery phase, and compile applicable records for permanent storage.
- Continue to maintain liaison as needed with external agencies.
- Update training programs, the Burlington Wastewater ERP, and standard operating procedures, as needed, based upon "lessons learned" during the emergency response and recovery phases of the event.

6 Action Plans

Specific Action Plans (APs) have been developed to address each of the high-risk threat scenarios identified in Burlington Wastewater's Vulnerability Assessment. Action Plans are tailored ERP actions that address specific major events. For security reasons, the procedures outlined in these documents are intentionally general in nature, omitting confidential details and effected assets. The specific APs are attached in the appendices following this main ERP document.

6.1 Man-Made Threats

Threat	Primary AP	Secondary AP	Secondary AP	Threat Type
Biosolids contaminated	AP-WW-100	-----	-----	Contamination
Grease build up plugs line	AP-WW-104	-----	-----	Process Disruption
Individual damages equipment	AP-WW-102	-----	-----	Destruction of Property
Individual in area without authorization.	AP-WW-105	-----	-----	Unauthorized Entry
IT disruption SCADA or Network	AP-WW-101	-----	-----	Process Disruption
Mechanical equipment disabled	AP-WW-102	-----	-----	Process Disruption
Pipeline deteriorates and breaks	AP-WW-106	-----	-----	Process Disruption
Process chemicals contaminated	AP-WW-100	-----	-----	Process Disruption
Toxins put in the raw wastewater	AP-WW-100	-----	-----	Contamination

6.2 Natural Disasters

Threat	Primary AP	Secondary AP	Secondary AP	Threat Type
Disruption of Service	AP-WW-103	-----	-----	Blizzard/Ice/Fire/Flood/Wind/Rain
Collection System Broken Pipe – River Crossing	AP-WW-107	-----	-----	Blizzard/Ice/Fire/Flood/Wind/Rain

7 Emergency Plan Approval, Update and Training

This section of the ERP describes the plan review, approval and update process, provides a plan for assessment of the ERP effectiveness, and gives information regarding Burlington Wastewater's ERP training program.

7.1 Plan Review, Approval and Update

The Burlington Wastewater ERP will be reviewed and approved on a regular basis by the Director, Public Works Assistant Director and the Chief Plant Operators. A revision log is kept in the front of the document to record and document all updates, and the Public Works Assistant Director will maintain the document control protocol to ensure that current copies of the ERP are not confused with old or outdated copies.

The Director or Public Works Assistant Director will also coordinate with City of Burlington, Vermont and other emergency response agencies that are mentioned in the ERP to ensure that team roles are understood, and to ensure consistency with other emergency planning programs.

The following triggers and time frames will be followed for review and update of the Burlington Wastewater ERP:

- Annually, with contact lists updated as needed.
- Upon update of the Vulnerability Assessment.
- Following an ERP exercise, or an actual activation of the ERP.

- Immediately when there is a wastewater system staff change where the staff member was named in the ERP.
- Immediately when there is a change in the roles and responsibilities of anyone involved in response activities.
- Immediately upon changes in internal and external contact information.

7.2 Assessment of ERP Effectiveness

To evaluate the effectiveness of the ERP and to ensure that procedures and practices developed under the ERP are adequate and are being implemented properly, the Burlington Wastewater staff will perform audits of the program on a periodic basis.

One method of audit will be through exercises and drills. Members of Burlington Wastewater management will act as observers during the exercises, and will evaluate the staff's performance in responding to emergency incidents as well as the overall effectiveness of the ERP in accomplishing its goals. Burlington Wastewater management will review the results of the evaluation, and the ERP and APs will be updated as appropriate to incorporate any lessons learned from the exercises.

The ERP program will also be discussed as an agenda item during the Public Works Assistant Director's meeting each time the VA is updated. At this time, Burlington Wastewater management and staff will discuss the need to update or augment the ERP based on new information regarding threats or critical asset vulnerability.

The Public Works Assistant Director maintains a file of ERP assessments and after-action reports.

7.3 Training, Exercises and Drills

All Burlington Wastewater personnel who may be required to respond to emergencies will receive initial and refresher training class on this ERP. The training will be conducted annually or when any of the following occurs:

- New employees are hired.
- Special emergency assignments are designated to operations staff.
- New equipment or materials are introduced.
- Procedures are updated or revised.

The training will consist of the following programs:

Orientation Sessions: The Orientation Sessions will include basic instruction and explanation of the ERP and Action Plan Procedures. Written tests may be used to ensure some level of comprehension by the attendees.

Table Top Workshop: Table Top Workshops involve developing scenarios that describe potential problems and providing certain information necessary to address the problems. Employees will be presented with a fabricated major event. Next they will verbally respond to a series of questions and then evaluate whether their responses match what is written in the ERP.

8 Additional Resources

The following is a list of references and Internet links that provide additional wastewater system security and ERP information.

Department of Homeland Security (DHS): DHS is the overall lead agency for homeland security issues. DHS will become involved in incident response if needed. General information is available at [<http://www.dhs.gov/dhspublic.>](http://www.dhs.gov/dhspublic) Information on the DHS National Incident Management System (NIMS) can be found at [<http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf>](http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf).

Environmental Protection Agency: EPA has numerous resources available. The following are key sources:

Water Infrastructure Security information, guidance, and training information can be found at [<http://www.epa.gov/safewater/security/index.html.>](http://www.epa.gov/safewater/security/index.html)

Information on Local Emergency Planning Committees (LEPCs) can be found at [<http://www.epa.gov/ceppo/lepclist.htm.>](http://www.epa.gov/ceppo/lepclist.htm)

Information on the EPA's Homeland Security Research Programs can be found at [<http://www.epa.gov/NHSRC.>](http://www.epa.gov/NHSRC)

The primary emphasis of the Water Security Research Program is on water supply, treatment, and distribution infrastructures in U.S. communities. Key research areas are detection and characterization of contaminants, response and mitigation, and prevention and protection. A secondary emphasis of the Water Security Research Program is on wastewater treatment and collection infrastructures, which include collection (sanitary and storm sewers, or combined sanitary-sewer systems) and impacts on receiving waters such as rivers, estuaries, or lakes.

The Center for Disease Control and Prevention (CDC): The CDC develops resources to assist hospital staff, clinics, and physicians in diagnosing diseases related to terrorism, reporting incidences of disease, and controlling the spread of infection. Information on emergency preparedness and response can be found at [<http://www.bt.cdc.gov>](http://www.bt.cdc.gov).

To assist in the development of a Public Health Response Plan, the CDC published a planning guidance document entitled The Public Health Response to Biological and Chemical Terrorism: Interim Planning Guidance for State Public Health Officials (July 2001), which can be found at [<http://www.bt.cdc.gov/Documents/Planning/PlanningGuidance.pdf>](http://www.bt.cdc.gov/Documents/Planning/PlanningGuidance.pdf).

Interim Recommended Notification Procedures for Local and State Public Health Department Leaders in the Event of a Bioterrorist Incident can be found at [<http://www.bt.cdc.gov/EmContact/Protocols.asp>](http://www.bt.cdc.gov/EmContact/Protocols.asp).

Federal Emergency Management Agency (FEMA): FEMA's mission is to reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of

mitigation, preparedness, response and recovery. FEMA takes the lead if an incident is assigned to DHS. General information can be found at [<http://www.fema.gov./>](http://www.fema.gov./) In addition, several online training courses relevant to emergency management are available on-line from FEMA at [<http://training.fema.gov/EMIWeb/IS/crslist.asp>](http://training.fema.gov/EMIWeb/IS/crslist.asp)

The American Water Works Association (AWWA): EPA training developed through partnership with AWWA covers the entire spectrum of security issues including assessing vulnerabilities, emergency response plans and risk communication. AWWA information can be accessed at their website, [<http://www.awwa.org/>](http://www.awwa.org/). Specific AWWA resources and documents, such as *Emergency Planning: The Big Picture for Water Utilities and Water Utilities*, and *Emergency Planning for Water Utilities (M19)* can be found at [<http://www.awwa.org/bookstore/ProductList.cfm?cat=12>](http://www.awwa.org/bookstore/ProductList.cfm?cat=12).

The Association of State Drinking Water Administrators (ASDWA): ASDWA has information on water security planning, training, and links to state programs and other information sources. Go to the security link at [<http://www.asdwa.org./>](http://www.asdwa.org./)

National Rural Water Association (NRWA): NRWA developed the "Security and Emergency Management System" (SEMS) Software Program, which can be loaded on a personal computer. It is based on NRWA/ASDWA's *Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems Serving Populations Between 3,300 and 10,000*. You can find more information at [<http://www.nrwa.org./>](http://www.nrwa.org./)

Agency for Toxic Substances and Disease Registry (ATSDR): ATSDR is directed by congressional mandate [<http://www.atsdr.cdc.gov/congress.html>](http://www.atsdr.cdc.gov/congress.html) to perform specific functions concerning the effect on public health of hazardous substances in the environment. These functions include public health assessments of waste sites, health consultations concerning specific hazardous substances, health surveillance and registries, response to emergency releases of hazardous substances, applied research in support of public health assessments, information development and dissemination, and education and training concerning hazardous substances. You can find more information at [<http://www.atsdr.cdc.gov./>](http://www.atsdr.cdc.gov./)

AP-WW-100 Contamination to Wastewater System

AP Summary:	This Action Plan applies to the introduction of a contaminant into the wastewater system. The contaminant could be introduced at any point within the system, including sewage lines, treatment facilities, or pump stations.	
Initiation and Notification:	<p>Initiate this AP if there is definitive evidence or information demonstrating that the wastewater system has been contaminated:</p> <ol style="list-style-type: none"> 1. There is analytical confirmation of the presence of one or more contaminants in the wastewater system. 2. The preponderance of the evidence confirms that a contamination incident has occurred. <ul style="list-style-type: none"> • There is a security breach with obvious signs of contamination along with unusual wastewater quality. • Additional findings (laboratory analysis, field observations) of continued site characterization activities add to other credible evidence of contamination. • Law enforcement agencies have discovered crucial evidence or apprehended a suspect that helps confirm that the wastewater has been contaminated. • Specific information on a number of potential contaminants is used in conjunction with other available information to narrow down the number of contaminant candidates. 3. Notify the Chief Operator(s) or the Assistant Public Works Director immediately upon discovery of credible evidence of threat (if not already notified). 4. Initiate full ERP activation. 5. Engage other organizations as needed (public health agency, response agencies, law enforcement). 6. Perform internal and external notifications according to ERP. 	<p><i>It may take several days to collect sufficient evidence to confirm a contamination incident, and the required time will depend on the type of information used for confirmation (some microbial analytical procedures may take several days).</i></p> <p><i>The individual who first becomes aware of the confirmed evidence should contact the Chief Operator immediately by whatever means of communication may be available.</i></p> <p><i>The Assistant DPW director will decide whether to initiate the ERP on a partial or full basis. The Assistant DPW will also decide when and to what extent to activate the EOC, and whether or not to turn control to the incident over to another agency such as a HAZMAT team, State DEC, law enforcement or public health.</i></p> <p><i>Notification phone numbers can be obtained from the Organization Contact List in the Appendices. The DPW Assistant Director or Chief Operator(s), should make the notifications to the outside agencies.</i></p>

AP-WW-100 Contamination to Wastewater System

Equipment Identified:	Equipment	Location	This equipment is available to assist in the execution of this AP.
	Lower Explosive Limit (LEL) Meter / Combustible Gas Detector or Organic Vapor Analyzer Composite Liquid Waste Sampler Grab Sampling Device (one liter caged bottle sampler) Laboratory-supplied sample containers (clean 250 ml. Glass wide-topped containers) Ice chests / ice for sample storage / shipping Equipment and PPE for confined space entry Equipment to open sewer manholes Sample logs Chain-of-Custody forms	All equipment listed is located each Treatment Plant.	
Specific Activities:			
I. Assess the Problem	<ol style="list-style-type: none">1. Assess results of previous sample analysis and attempt to identify the contaminant.2. Confirm the identity of the contaminant. Attempt to locate the discharge source of the contaminant.3. Perform a full characterization of the contaminated area, including contaminant properties, contaminant concentration profiles, and characteristics of the impacted area.4. Evaluate the likely direction and extent of future movement of the contaminant within the system.5. Evaluate all available information about the contamination incident.		<i>Effective implementation of response actions depends on positive identification of the contaminant and knowledge of contaminant properties, including public health protection strategies and selection of treatment technologies. If information from site characterization activities indicates that the contaminant impacts wastewater quality in a certain manner (i.e. alters BOD or COD), the contaminant specific information may facilitate tentative identification of a contaminant and determine the analytical approach that should be used to positively identify the specific contaminant. Sources of contaminant information include: http://www.bt.cdc.gov/agent/agentlistchem.asp http://www.cdc.gov/atsdr/index.html</i>
II. Isolate and Fix the Problem	<ol style="list-style-type: none">6. Take actions to isolate portions of the system containing suspect wastewater. Make arrangements with outside, unaffected treatment plants to bring in activated "seed sludge" to restore the biological treatment system more quickly.7. Shut down system if obvious or confirmed contamination warrants.8. Revise public health response measures and public		<i>The contaminated area can be estimated using hydraulic modes, public health agency reports, wastewater quality data, or other available information. The estimate may define additional locations where site characterization should be performed.</i>

AP-WW-100 Contamination to Wastewater System		
	notifications as necessary.	
III. Monitoring	9. Continue sampling and analysis to monitor the status and extent of the contamination, and to verify that containment strategies are working.	
IV. Recovery and Return to Safety	<p>10. Consult with appropriate officials to develop a Remediation and Recovery Plan.</p> <ul style="list-style-type: none"> a. Evaluate options for treating contaminated wastewater and rehabilitating system components. b. Select treatment and rehabilitation technology/approach. c. Develop strategy for disposal of contaminated liquid and solids streams. d. Develop plan for cleaning of system components. e. Make provisions for long-term alternate wastewater collection and/or treatment schemes, if necessary. f. Develop sampling and analysis plan to verify remediation of contamination to acceptable levels. g. Develop communications and public relations plan. <p>11. Implement Remediation and Recovery Plan.</p> <ul style="list-style-type: none"> a. Verify that wastewater is safe by performing additional sampling and analysis to confirm the progress of system treatment and remediation. b. Notify public that wastewater is safe. c. Return to normal operations. d. Store wastewater samples for appropriate hold time based on analyses. 	<p><i>Remediation and recovery activities will likely be planned and implemented by a number of agencies. The first step of the process is to establish the roles and responsibilities of each organization.</i></p> <p><i>The samples obtained during site characterization and monitoring should be stored in case the situation changes and further analysis is determined to be necessary.</i></p> <p><i>Biosolids should be analyzed also, and if necessary, steps should be taken to isolate the contaminated biosolids and disposed of accordingly. Communication with the CSWD should be established if there is a credible threat to the biosolids.</i></p>
V. Report of Findings	12. File incident reports with internal and external agencies as required.	<i>The Assistant Director or CPO should file an internal report for the Utility's files, and also provide information as requested to outside agencies.</i>
VI. AP-WW-100 Revision Dates	7-10-07	

SCADA System Failure

AP-WW-101			
AP Summary:	This Action Plan applies to... SCADA/Network System Failure		
Initiation and Notification:	This Action Plan primarily applies to SCADA or Network problems due to software or hardware issues that may affect the operations of the Main, East or North WWTFs.		<i>Some preventative measures listed below may expedite recovery times. Limiting access to the computers having passwords, i.e., SCADA computer with no internet connections and phone number connections private. Backing up and upgrading software periodically. Having uninterruptible power supplies and surge protection on all critical equipment.</i>
Equipment Identified:	Equipment	Location	<i>Program currently in use at Main Plant Wonderware. Choice of software for East & North not yet determined.</i>
	SCADA, PLCs, Wonderware software	Main, East & North WWTF	
Specific Activities:	Main Plant is run exclusively with SCADA but can be run entirely in a manual mode.		<i>East & North Plant are not yet run by SCADA.</i>
I. Assess the Problem	Determine if the problem is with the City Network or a SCADA system problem. If there is a Network issue, contact Pat Schmitz or the IT department at 865-7017. If there is a SCADA problem, proceed to the next step.		
II. Isolate and Fix the Problem	Determine the nature of the problem, i.e. software or hardware. Before contacting a private IT programmer, check with plant staff to see if the problem can be dealt with internally.		<i>If alarms are involved, notify Home Security at 1-800-933-4762 to explain the situation. Also notify the on call person and the rest of plant staff. If the problem requires IT support, contact Al Stier, Hallam ICS @ 658-5327, pager 351-4865 for Main Plant issues, and Steve Roy @865-7258 or cell 343-0125 for East & North Plants.</i>
III. Monitoring	While the SCADA or PLC failure is being repaired it is important to maintain all vital equipment. All plant equipment can be run manually. Develop a checklist on critical equipment and any manual dosing that may need attention.		<i>Take steps to prevent the problem from occurring again.</i>
IV. Recovery and Return to Safety	Once the system is restored, check all equipment and vital programming for "glitches". Make sure to do a back up and review what went wrong.		
V. Report of Findings			

AP-WW-101	
VI. [AP ID] - Revision Dates	4-2-07

Individual Damages Equipment

AP-WW-102			
AP Summary:	This Action Plan applies to... An individual damaging equipment and Mechanical equipment that has been disabled in some way at the City of Burlington's Main East or North wastewater Treatment Facilities.		
Initiation and Notification:	Depending on the piece of equipment, the alarm monitoring company may receive an alarm and notify the on call person or plant staff doing daily rounds, discovers a problem.		<i>Plant Staff should notify the Chief operator and/or the Plant mechanic as well as other staff members that a piece of equipment is not working. If foul play is suspected, contact the Police Department.</i>
Equipment Identified:	Equipment	Location	
	All Mechanical equipment	At The WWTP's	
Specific Activities:	See note on right.		<i>If vandalism is involved, minimize the disturbance in that area. Also take photos and look for unusual activities. A thorough check of the process equipment and grounds should also be done.</i>
I. Assess the Problem	Determine the cause of the problem. If possible, Start a backup piece of equipment. Call in other staff if necessary.		<i>Do whatever is necessary to prevent or mitigate a violation and document actions taken, estimate time, flow etc. In cases of a disinfection failure at Main Plant, follow the SOP's in place.</i>
II. Isolate and Fix the Problem	Re-routing flows or bypassing maybe necessary in order to repair a problem. Take necessary safety precautions and consult O&M manuals to ensure proper parts are ordered, if not in stock.		<i>In many cases redundant equipment will allow repair work to be done and bypass will not be necessary. Make sure all equipment being worked on is locked out.</i>
III. Monitoring	Upon repairing or re-enabling equipment, observe the operation of the equipment to ensure it is running properly.		<i>Be sure to notify other plant staff and the alarm company (if the equipment was on test for example) that you will be starting the equipment again.</i>
IV. Recovery and Return to Safety	After the equipment has been re-started and working properly, return to normal duties		
V. Report of Findings	Document in the corrective maintenance log any repairs that were done.		<i>In cases where an insurance claim may be made, document all hours worked, purchases and invoices</i>
VI. [AP ID] - Revision Dates	3/30/07- Tim Grover		

Disruption of Service

AP-WW-103			
AP Summary:	This Action Plan applies to... Power Outage at a Lift Station		
Initiation and Notification:	Normally the On-Call person would receive notification of a power outage via the alarm monitoring station or someone calling because of an audible and/or visual alarm on the station.		<i>Alarm monitoring station is Home Security for stations with telephone alarm dialers. All other stations have audible and visual alarms. If there is a problem with the dialer itself, Omega should be called.</i>
Equipment Identified:	Equipment	Location	<i>When taking a call be sure to ask the location of the alarm(s).</i>
Specific Activities:	On-Call person should respond to the alarming station as quickly as possible.		<i>If the On-Call person cannot respond, he should call in someone else immediately.</i>
I. Assess the Problem	Determine whether the power is off at the pole or only at the station. If power is off at the pole, Burlington Electric should be notified immediately and try to determine how much longer the power is going to be off. If power is coming to the station but the station is out, troubleshoot to determine problem.		<i>BED gets most power outages resolved within a couple of hours. If BED is not the problem and you cannot determine the problem, call your chief operator for help and/or suggestions. If multiple stations are down, see EPFP included in this ERP binder.</i>
II. Isolate and Fix the Problem	Depending on the station that is out, a tanker may be required to maintain wet well levels while the power is out. If this is the case, a second operator should be called in to assist. All efforts should be made to get the station up and running as soon as possible. If there is question regarding holding capacity of the station see the Electric Power Failure Plan (EPFP) for the appropriate service area.		<i>If the station is not going to be back on line before the wet well is full, the sewage must be hauled out by truck either to a treatment plant or the closest available gravity line which does not go to that station.</i>
III. Monitoring	Upon station going back on line, run each pump individually to assure that each is actually pumping. After verifying pumping, place all switches back to AUTO and stay to observe at least a couple of normal pumping cycles before leaving.		<i>If you cannot get the station operating, call in someone else to help. If unsure who should be called, call your chief operator.</i>
IV. Recovery and Return to Safety	When you are sure the station is operating normally, you may leave.		

AP-WW-103

V. Report of Findings	Be sure to notify the pump station chief operator in the event that the station is going to be off line for any amount of time, or if you are having difficulty determining the problem. If station is put back on line with minimal problems, then notification does not have to occur until the start of the next workday.	<i>If the station overflows sewage, the chief operator and/or the Ass. Director must be notified immediately as this requires the State of Vermont to be notified also.</i>
VI. [AP ID] - Revision Dates	3/13/07 – Gary Greenwood	

Sewer Line Grease Plug

AP-WW-104							
AP Summary:	This Action Plan applies to... Gravity Sewer Line Grease Plug						
Initiation and Notification:	Normally the On-Call person would receive notification of this type of problem from a customer experiencing sewer problems, or from the Street Department.		<i>This type of sewer problem is usually reported to the Street Dept. and not Wastewater. Dick Hammond is the Foreman for Streets, #316-7680</i>				
Equipment Identified:	<table><tr><th>Equipment</th><th>Location</th></tr><tr><td> </td><td> </td></tr></table>	Equipment	Location			<i>When taking a call be sure to ask the location of the alarm(s).</i>	
Equipment	Location						
Specific Activities:	The On-Call person should respond to the call as quickly as possible.		<i>If the On-Call person cannot respond, he should call in someone else immediately.</i>				
I. Assess the Problem	If you are the first person on the site and determine that there is a plug in the gravity sewer line, the Street Department should be notified immediately		<i>To determine if the sewer line is plugged, you may have to open several sewer manholes before and after the plug looking for a drop or loss of flow.</i>				
II. Isolate and Fix the Problem	The Street Department effects repairs on the collection system, however, the person responding can assist if needed. If there is a station on the line the plug may be blocking flow to it and by monitoring the wet well you may be able to tell when the Street Dept. gets the blockage cleared.		<i>If the problem is determined to be in an individual house's service line to our collection system, then it is the home owner's responsibility to effect repairs.</i>				
III. Monitoring	The Street Dept. has an inspection program for the known "hot spots" in the collection system.		<i>Hot Spots include Surf Rd. Star Farm Nursing Home</i>				
IV. Recovery and Return to Safety							
V. Report of Findings	If the problem is determined to be caused by grease, we may want to ask that the Street Dept. do more often inspections of the effected line(s), i.e., with the camera truck. We may also need to send the neighborhood residents a letter to remind them of the sewer ordinances.						
VI. [AP ID] - Revision Dates	Gary Greenwood March 19, 2007						

Individual in Area Without Authorization

AP-WW-105						
AP Summary:	This Action Plan applies to... Individual in Area without Authorization					
Initiation and Notification:	During regular working hours this would include someone on the grounds or in a building who is not authorized.	<i>After hours, Main Wastewater is the only plant that has a burglar alarm for the Administrative area including the lab and offices.</i>				
Equipment Identified:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; padding: 2px;">Equipment</th> <th style="width: 50%; padding: 2px;">Location</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Burglar Alarm</td> <td style="padding: 2px;">Main Plant Admin. Area only</td> </tr> </tbody> </table>	Equipment	Location	Burglar Alarm	Main Plant Admin. Area only	<i>An alarm would be sent to Home Security after hours, the Burlington Police Dept. and the on-call person would be dispatched.</i>
Equipment	Location					
Burglar Alarm	Main Plant Admin. Area only					
Specific Activities:	Area breached. Either DPW staff or other means conclude that someone has entered one of the three treatment plants or associated grounds without approval.					
I. Assess the Problem	Quickly determine if a threat exists. Either dial 911 if near a phone or radio for help from a coworker.	<i>If after hours allow police to scan area for intruder first.</i>				
II. Isolate and Fix the Problem	If a threat exists evacuate the area.					
III. Monitoring	Return to work site only when the area has been secured.					
IV. Recovery and Return to Safety	Determine if there are any improvements needed to the grounds or buildings for future security.	<i>Reset alarms, call Home Security, secure doors and gate.</i>				
V. Report of Findings	Report to CPO.					
VI. [AP ID] - Revision Dates	4-6-07					

Collection System Broken Pipe

AP-WW-106			
AP Summary:	This Action Plan applies to... a Broken Pipe in the Collection System		
Initiation and Notification:	Public Works discovers a problem due to a customer complaint or other reason such as a sink hole, reduced flow at WWTP etc.		Dispatcher should notify DPW Right of Way Foreman, Assistant Director Water Quality, City Engineer or Chief Operator of affected area.
Equipment Identified:	Equipment	Location	
	Equipment that could be used for a repair includes mud suckers at Streets; a 4" portable pump at East & North Plant. Hertz First Choice rental for other equipment @872-5300		
Specific Activities:	Area should be secured with appropriate Traffic Control measures such as cones, barricades.		
I. Assess the Problem	Check upstream and down stream manholes, use the camera truck and film the pipe to get a more accurate assessment to determine a repair strategy and the equipment and staff needed.		If the pipe that is broken is in a river crossing a different Action Plan applies. See AP-WW-107 Collection System River Crossing
II. Isolate and Fix the Problem	If the depth of the repair is something Streets can excavate line up crew and equipment.		If the excavation required is too deep or beyond DPW capacity, contact previously utilized contractors such as Engineers Construction at 863-6389. If bypass is needed set up for this diversion prior to the start of work.
III. Monitoring	Ensure that while repair is undertaken, wastewater continues to flow to intended pipe.		In the case of overflows or discharges to natural waterways notify DEC, 802-241-3822
IV. Recovery and Return to Safety	After repair work is completed, review the pipeline by videotaping and cleaning loose gravel, etc., out of the pipeline.		
V. Report of Findings	Has the pipe been adequately repaired or is further replacement of a larger section of pipe recommended.		Streets should communicate with Engineering group and then Assistant Director Water Quality with long-term recommendations is necessary.
VI. [AP ID] - Revision Dates	4-2-07		

Collection System Broken Pipe – River Crossing

AP-WW-107			
AP Summary:	This Action Plan applies to... a Broken Pipe in the Collection System		
Initiation and Notification:	Public Works discovers a problem due to a sudden or unexpected reduction of flow at the treatment plant or a report from a citizen located near a water body.		<i>Dispatcher should notify Chief Operator of affected area, Assistant Director Water Quality, DPW Director or DPW Project Engineer.</i>
Equipment Identified:	Equipment	Location	<i>Siphon at second crossing on the Winooski River is 24" cast iron pipe.</i>
	<i>Tanker Trucks from both East & North Plants, and private contractor such as Hartigan. repair includes mud suckers at Streets; a 4" portable pump at East & North Plant. Hertz First Choice rental for other equipment @872-5300</i>	<i>Treatment Plants Hartigan Company – Stowe VT 800-696-0761</i>	
Specific Activities:	Area should be secured with appropriate Traffic Control measures such as cones, barricades.		<i>Flow should be stopped at first crossing if second crossing is broken.</i>
I. Assess the Problem	Dye should be added to the grit chamber at Plattsburgh Ave. to see if it surfaces in the River or the treatment plant.		<i>If the pipe that is broken is in the Winooski river crossing notification must be made to DEC @ 802-241-3822 and the Town of Colchester Town Manager @ 654-0709</i>
II. Isolate and Fix the Problem	If dye surfaces in the river contact Dave Hathaway of M&K Commercial Diving immediately @ 802-775-7744 or pager 802-742-6255. If M&K is unreachable call Eugene Brunelle of Blue Water Diving at 893-0566		<i>In the interim prior to repair, the tanker trucks must be brought to the Plattsburgh Ave., grit pit to collect flow and discharge to the attached identified manholes.</i>
III. Monitoring	Ensure that while repair is undertaken, wastewater continues to flow to intended pipe.		<i>In the case of overflows or discharges to natural waterways notify DEC, 802-241-3822</i>
IV. Recovery and Return to Safety	After repair work is completed, video the pipeline exterior with the divers to create a record of completion.		<i>Contact all parties that the repair is complete, including the StateDEC and the Town of Colchester.</i>
V. Report of Findings	Has the pipe been adequately repaired or is further replacement of a larger section of pipe recommended.		<i>If the second crossing has broken, directional drilling similar to the first crossing may be required.</i>
VI. [AP ID] - Revision Dates	6-4-07		

Appendix 1 - Wastewater Sample News Release - Known Contaminant

NEWS RELEASE

Burlington Public Works Wastewater

August 21, 200

KNOWN CONTAMINANT HAS ENTERED NEW RIVER'S SEWER SYSTEM

*Burlington Residents Should Refrain From Non-Essential Water Use and
Remain Clear of Barricaded Areas*

A hazardous solvent material called Trichloroethylene (TCE) has entered the Burlington wastewater collection system at two known locations in the downtown area of the City.

Burlington Public Works Wastewater has issued a "Minimize Non-Essential Water Usage" notice and shut down a portion of the sewer system. City Officials ask that all residents, businesses and industries refrain from non-essential water use or activities that result in discharges to the sewer system (such as unnecessary toilet flushing, washing machine usage and dishwashing) until further notice.

TCE is a colorless liquid, which is used as a solvent for cleaning metal parts. Breathing high levels of TCE may cause nervous system effects, liver and lung damage, abnormal heartbeat, coma, and possibly death. Burlington Residents are advised to avoid contact with all sanitary sewer pipes, manholes, and lift stations in the _____ Area.

The City Emergency Operations Center is activated, and actions are underway to remove the TCE from the sewer system.

The "Minimize Non-Essential Water Usage" order will remain in effect until officials from the City of Burlington have cleared the wastewater system for normal operations.

The City of Burlington has set up a 24-hour Hotline for residents to obtain updated information regarding this matter. The Hotline number is (XXX) XXX-XXXX.

Appendix 2 - Wastewater Sample News Release - Sewer Main Break

NEWS RELEASE

*Burlington Public Works Wastewater
August 21, 200*

SEWER FORCE MAIN BREAKS IN _____ AREA

*Burlington Residents in the vicinity of _____ Should Refrain
from Non-Essential Water Use*

Burlington Public Works repair crews arrived at Pump Station 302 located at 400 Main Street at 10:30 AM today in response to a submerged 12-inch sewer force main break. The sewage spill was mostly contained as of this afternoon at 3:15 PM, and repairs to the pipeline are underway.

Residents of the affected areas have not lost sewer services, but officials have asked that all residents in the _____ area of town, refrain from non-essential water use, such as unnecessary toilet flushing, washing machine usage and dishwashing until further notice.

Caution signs have been posted at _____ asking residents to refrain from all recreational uses of the water in including wading, fishing and swimming, until further notice.

Burlington Public Works Wastewater has notified the State Department of Health and the State Department of Environmental Protection. The County Board of Health is monitoring the potential water quality impacts. Officials will notify the public and remove the warning signs when _____ is safe for recreational use.

For more information, please contact Laurie Adams, Assistant Director Water Quality 802-863-4501.

**Appendix 3 - Wastewater Sample News Release - Untreated
Sewage Discharge**

NEWS RELEASE

Burlington Public Works Wastewater

August 21, 200

NOTICE OF DISCHARGE OF UNTREATED SEWAGE

The City of Burlington had a discharge of untreated sewage from a pump station located at 1450 Main Street of approximately 30,000 gallons. The discharge was first discovered on December 7, 200 at 2:00 p.m. and lasted for approximately 5 hours. The untreated wastewater entered Lake Champlain through a seasonal streambed. The discharge was the result of an electrical explosion that caused the lift station pump motor to become inoperative. The electrical wiring and pump motor were repaired to prevent further discharge.

Burlington Wastewater contacted health and regulatory agencies about the discharge. The Parks and Recreation Department has posted signs at the _____ Area warning people not to come in contact with the water. Utility staff is analyzing water samples taken from the Lake. The warning signs will be removed when the water is determined to be safe for swimming and boating.

For more information, please contact Laurie Adams, Assistant Director Water Quality at 802-863-4501.

Appendix 4 - Wastewater IT Incident Response and Reporting Checklist

Threat Evaluation Worksheet

INSTRUCTIONS

The purpose of this worksheet is to help organize information about a contamination threat warning that would be used during the Threat Evaluation Process. The individual responsible for conducting the Threat Evaluation (e.g., the Utility Emergency Response Manager) should complete this worksheet. The worksheet is generic to accommodate information from different types of threat warnings; thus, there will likely be information that is unavailable or not immediately available. Other forms in the Appendices are provided to augment the information in this worksheet.

THREAT WARNING INFORMATION

Date/Time threat warning discovered: _____

Name of person who discovered threat warning: _____

Type of threat warning:

- | | | |
|--|--|---|
| <input type="checkbox"/> Security breach | <input type="checkbox"/> Witness account | <input type="checkbox"/> Phone threat |
| <input type="checkbox"/> Written threat | <input type="checkbox"/> Law enforcement | <input type="checkbox"/> Unusual wastewater quality |
| <input type="checkbox"/> News media notification | <input type="checkbox"/> Consumer complaints | <input type="checkbox"/> Public health |
| <input type="checkbox"/> Other _____ | | |

Identity of the contaminant: ☐ Known ☐ Suspected ☐ Unknown

If known or suspected, provide additional detail below

☐ Chemical ☐ Biological ☐ Radiological

Describe _____

Time of contamination: ☐ Known ☐ Estimated ☐ Unknown

If known or estimated, provide additional detail below

Date and time of contamination: _____

Additional Information: _____

Mode of contamination: ☐ Known ☐ Suspected ☐ Unknown

If known or suspected, provide additional detail below

Method of addition: ☐ Single dose ☐ Over time ☐ Other _____

Amount of material: _____

Additional Information: _____

Site of contamination: ☐ Known ☐ Suspected ☐ Unknown

If known or suspected, provide additional detail below

Number of sites: _____

Provide the following information for each site.

Site #1

Site Name: _____

Type of facility

- | | |
|--|--|
| <input type="checkbox"/> Collection System | <input type="checkbox"/> Pump station |
| <input type="checkbox"/> Sewer System | <input type="checkbox"/> Septage Receiving Station |
| <input type="checkbox"/> Treatment Plant | |
| <input type="checkbox"/> Other _____ | |

Address: _____

Additional Site Information: _____

Site #2

Site Name: _____
 Type of facility
☐ Collection System ☐ Pump station
☐ Sewer System ☐ Septage Receiving Station
☐ Treatment Plant
☐ Other _____
 Address: _____

 Additional Site Information: _____

Site #3

Site Name: _____
 Type of facility
☐ Collection System ☐ Pump station
☐ Sewer System ☐ Septage Receiving Station
☐ Treatment Plant
☐ Other _____
 Address: _____

 Additional Site Information: _____

ADDITIONAL INFORMATION

Has there been a breach of security at the suspected site? ☐ Yes ☐ No
If "Yes", review the completed 'Security Incident Report' (Appendix 8.3)

Are there any witness accounts of the suspected incident? ☐ Yes ☐ No
If "Yes", review the completed 'Witness Account Report' (Appendix 8.4)

Was the threat made verbally over the phone? ☐ Yes ☐ No
If "Yes", review the completed 'Phone Threat Report' (Appendix 8.5)

Was a written threat received? ☐ Yes ☐ No
If "Yes", review the completed 'Written Threat Report' (Appendix 8.6)

Are there unusual wastewater quality data ☐ Yes ☐ No
Are there unusual symptoms or disease in the population? ☐ Yes ☐ No

If "Yes", review the completed 'Public Health Report' (Appendix 8.8)
Is a 'Site Characterization Report' available? ☐ Yes ☐ No
If "Yes", review the completed 'Site Characterization Report' (Module 3, Appendix 8.3)

Are results of sample analysis available? ☐ Yes ☐ No
If "Yes", review the analytical results report, including appropriate QA/QC data

Is a 'Contaminant Identification Report' available? ☐ Yes ☐ No
If "Yes", review the completed 'Sample Analysis Report' (Module 5, Appendix 8.1)

Is there relevant information available from external sources? ☐ Yes ☐ No
Check all that apply

☐ Local law enforcement ☐ FBI ☐ Pretreatment Program
☐ Public health agency ☐ Hospitals / 911 call centers ☐ US EPA / Water ISAC
☐ Media reports ☐ Homeland security alerts ☐ Neighboring utilities
☐ Other _____

Point of Contact: _____

Summary of key information from external sources (provide detail in attachments as necessary):

THREAT EVALUATION

Has normal activity been investigated as the cause of the threat warning? ☐ Yes ☐ No

Normal activities to consider

- | | |
|--|--|
| <input type="checkbox"/> Utility staff inspections | <input type="checkbox"/> Routine wastewater quality sampling |
| <input type="checkbox"/> Construction or maintenance | <input type="checkbox"/> Contractor activity |
| <input type="checkbox"/> Operational changes | <input type="checkbox"/> Wastewater quality changes with a known cause |
| <input type="checkbox"/> Other _____ | |

Is the threat 'possible'? ☐ Yes ☐ No

Summarize the basis for this determination: _____

Response to a 'possible' threat:

- | | | |
|--|--|--------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> Site characterization | <input type="checkbox"/> |
| Isolation/containment | | |
| <input type="checkbox"/> Increased monitoring/security | <input type="checkbox"/> Other | _____ |

Is the threat 'credible'? ☐ Yes ☐ No

Summarize the basis for this determination: _____

Response to a 'credible' threat:

- | | | |
|---|--|--|
| <input type="checkbox"/> Sample analysis | <input type="checkbox"/> Site characterization | <input type="checkbox"/> Isolation/containment |
| <input type="checkbox"/> Partial EOC activation | <input type="checkbox"/> Public notification | |
| <input type="checkbox"/> Other _____ | | |

Has a contamination incident been confirmed? ☐ Yes ☐ No

Summarize the basis for this determination: _____

Response to a confirmed incident:

- | | | |
|--|--|--|
| <input type="checkbox"/> Sample analysis | <input type="checkbox"/> Site characterization | <input type="checkbox"/> Isolation/containment |
| <input type="checkbox"/> Full EOC activation | <input type="checkbox"/> Public notification | |
| <input type="checkbox"/> Initiate remediation and recovery | | |
| <input type="checkbox"/> Other _____ | | |

How do other organizations characterize the threat?

Organization	Evaluation	Comment
<input type="checkbox"/> Local Law Enforcement	<input type="checkbox"/> Possible <input type="checkbox"/> Credible <input type="checkbox"/> Confirmed	
<input type="checkbox"/> FBI	<input type="checkbox"/> Possible <input type="checkbox"/> Credible <input type="checkbox"/> Confirmed	
<input type="checkbox"/> Public Health Agency	<input type="checkbox"/> Possible <input type="checkbox"/> Credible <input type="checkbox"/> Confirmed	
<input type="checkbox"/> Drinking Water Primacy Agency	<input type="checkbox"/> Possible <input type="checkbox"/> Credible <input type="checkbox"/> Confirmed	
<input type="checkbox"/> Other	<input type="checkbox"/> Possible <input type="checkbox"/> Credible <input type="checkbox"/> Confirmed	
<input type="checkbox"/> Other	<input type="checkbox"/> Possible <input type="checkbox"/> Credible <input type="checkbox"/> Confirmed	

SIGNOFF

Name of person responsible for threat evaluation:

Print name _____

Signature _____

Date/Time: _____

Source: EPA Response Protocol Toolbox Module 2, Section 8.2 – Interim Final December 2003

Appendix 5- Wastewater Shut Down Table and Instructions

IT Incident Response and Reporting Checklist

Date _____ Time _____

Status:

- ☐ Site Under Attack
- ☐ Past Incident
- ☐ Repeated Incidents
- ☐ Unresolved

Contact Information:

Name _____

Title _____

Utility _____

Direct-dial phone _____

E-mail _____

Location / Site
involved _____

Street Address _____

City _____

State/ZIP _____

1. What is the nature of the emergency? (Check all that apply)
 - ☐ Denial of Service attack
 - ☐ Unauthorized electronic monitoring
 - ☐ Network intrusion
 - ☐ Insider attack
 - ☐ Probe/scan
 - ☐ Malicious code (virus, Trojan horse, worm)
 - ☐ Website defacement
 - ☐ Other (explain)
2. Is there just one, or more than one, incident involved simultaneously?
3. Is this a single or multi-site incident?
4. What is the extent of penetration / infection?
5. Estimate the duration of attack
6. What is the entry point of the incident (network, the phone line, etc)?
7. What resources will be required to deal with this incident? (A Computer Emergency Response Team with a forensic expert might be needed immediately to analyze a major incident versus simply disconnecting the compromised equipment from the Internet for later analysis)
8. What is the source of the attack?
9. What is the target of the attack?
10. Impact of attack
11. Has there been a loss or compromise of business data?
12. What type of data has already been compromised or is at risk?
13. How critical is this data?
14. Affect on customers (Customers might be sensitive, based on the intensity level of the intellectual property loss. It could be a violation of privacy legislation versus a serious theft of software property, critically affecting a customer's enterprise-level business)
15. Estimate system downtime

16. Document damage to systems
17. Estimate financial loss
18. Has there been damage to the integrity or delivery of water or services?
19. Describe
20. Other utility systems affected
21. Severity of attack (include financial loss)
☐ Low ☐ Medium ☐ High
22. Did the attacker gain root, administrative or system access?
23. How was the incident detected?
24. Intrusion detection system or audit logs
25. External complaint
26. User report
27. Other
28. What are the known symptoms?
29. What utility areas are affected?
30. What systems are affected?

Gather as much information as possible about the systems, including suspected systems. For example:

- ☐ Operating system
- ☐ Platform
- ☐ Applications
- ☐ IP addresses
- ☐ Associated or suspected user IDs
- ☐ Most recent changes applied
- ☐ Other related items

31. Are the backups of the perceived affected systems available (provide all of the information regarding online, onsite, or offsite backups)?

See www.cert.org/tech_tips/intruder_detection_checklist.html for more information on detecting an intruder.